STS-134/ULF6

FD 09 Execute Package

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083	17	FD09 Mission Summary
084	18 - 21	ULF6 EVA Grease Gun Cleanup
085	22 - 23	STS-134/ULF6 FD9 EVA DELTAS
086	24 - 47	STS-134/ULF6 EVA3 TIMELINE UPDATES
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089	50 - 54	BRT Ballstack Stiffness Adjustment
091	---	FD9 Event Summary Message (KPIX-TV, KGO-TV and KFBK-Radio) (Not Distributed)
092A	---	FD9 Event Summary Message (The Daily, KDKA, Pittsburgh Tribune-Review and KTRK) (Not Distributed)
093	55	STORRM Cable Troubleshooting
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Approved by FAO: *M. Scheib*
Approved by OpsPlan: *J. Kitchen*

Michael Scheib

Last Updated: May 22 2011 12:23 AM GMT
JEDI *(**J**oint **E**xecute package **D**evelopment and **I**ntegration), v3.0*

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088	FD09 ULF6 SODF Warning PCN Incorporation
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091	FD9 Event Summary Message (KPIX-TV, KGO-TV and KFBK-Radio)
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1. Post-Sleep Cryo Config
   For today's post-sleep cryo config, O2 tanks 1 & 2, and H2 tanks 1 & 5 will be active.

   R1 O2,H2 MANF VLV TK1 (two) - OP (tb-OP)
   O2 TK2 HTRS A,B (two) - AUTO

   A15 CRYO TK5 HTR O2 A - OFF

2. Pre-Sleep Cryo Config
   √MCC for deltas prior to configuring for pre-sleep.

   For tonight's pre-sleep cryo config, manifold 1 will be closed with O2 and H2 tanks 1 & 5 active.

   A15 CRYO TK5 HTR O2 A - AUTO

   R1 O2 TK2 HTRS A,B (two) - OFF
   O2,H2 MANF VLV TK1 (two) - CL (tb-CL)

3. EVA Camera
   Today Ron will be performing an EVA Camera Turnaround task for the two cameras you will take outside on EVAs 3 and 4. To prevent another camera from turning off unintentionally, he'll be taping the power switch in the ON position. Reference MSG 094 for details.

4. STORRM Cable Troubleshooting
   Mark/Drew, On FD7 during the VNS data retrieval from DRU1, the data transmission halted several times with a duration of half an hour to an hour each. As a result, we've added a STORRM CABLE TROUBLESHOOTING procedure (reference Message 093)prior to the FD9 STORRM DAILY ACT. We still have about another hour of data to retrieve from DRU1 before we start retrieving the rest of the data from DRU3. Therefore, you'll run the STORRM DAILY ACT as written (vs. powering down either DRU immediately after activation as has been done on previous days). We've then added a callout in the afternoon to powerdown DRU1 after we complete the data retrieval to prevent it from potentially overheating. Then, at the end of the day, you'll perform STORRM DAILY DEACT.

5. IENOS
   Roberto, Since the IENOS LEDs are no longer blinking, you can remove them from the LAB and stow them for return. We have added IENOS deactivation and stow to your timeline today.

6. EVA Mark, Drew, Taz, and Spanky - we have several messages for you today. Let us know if you have any questions reviewing the new EVA3 Procedures. Good luck on EVA3!!!
   - MSG 28-005 (134-085) STS134-ULF6 FD9 EVA DELTAS contains words on your Glove Photos, Suit Cleaning, and Water Mitigation for EMU 3005. The MSG also contains updates to EVA 3 Tool Config., items for EVA 3 procedure review, and A/L Prep.
   - MSG 28-006 (134-086) STS-134/ULF6 EVA3 TIMELINE UPDATES has EVA3 Procedure Updates. Your new EVA3 Tool Config is included in this message. Also, reference this message for the EVA IR Camera Setup/Task Review and Procedure Review activities today.
   - MSG 27-0604 (134-084) STS-134/ULF6 EVA GREASE GUN CLEANUP has the procedure for the Grease Gun Cleanup task today.
   - During EVA 1 and 2 it was reported that BRT Ballstacks felt ‘loose’. MSG 28-0012 (134-089) BRT Ballstack Stiffness Adjustment Procedure contains the procedure steps to adjust the stiffness of the BRT Ballstack. If you desire to adjust your BRT and time permits during EVA Tool Config or EVA Procedure Review, it is okay to perform this procedure on one BRT at at time. Please perform a verification test before starting the procedure on another BRT. If more time is required, Grease Gun Clean up can be deferred to a later date. Please let MCC-H know if this adjustment is performed.

7. STAR PAIRS PAD
   MSG 099 has the Updated Star Pairs Pad and Cue Card. These go into effect at MET 8/00:00. This replaces MSG 002.

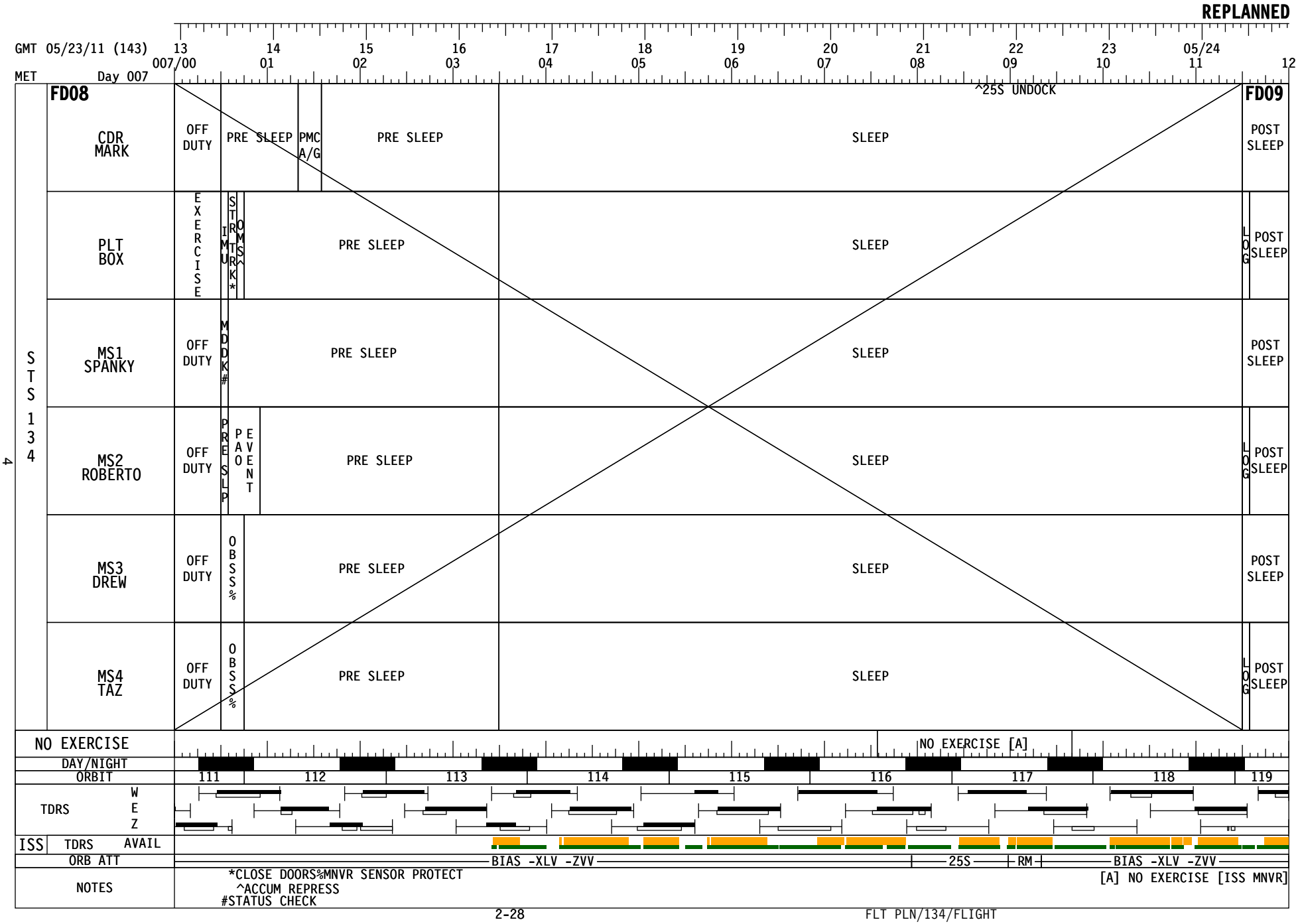
8. STOWAGE OPS
   For Box and Roberto: We have uplink message 134-79: ULF6 Stowage Overview for FD9. This contains the current stowage plan for your Stowage Ops Activities on todays timeline.

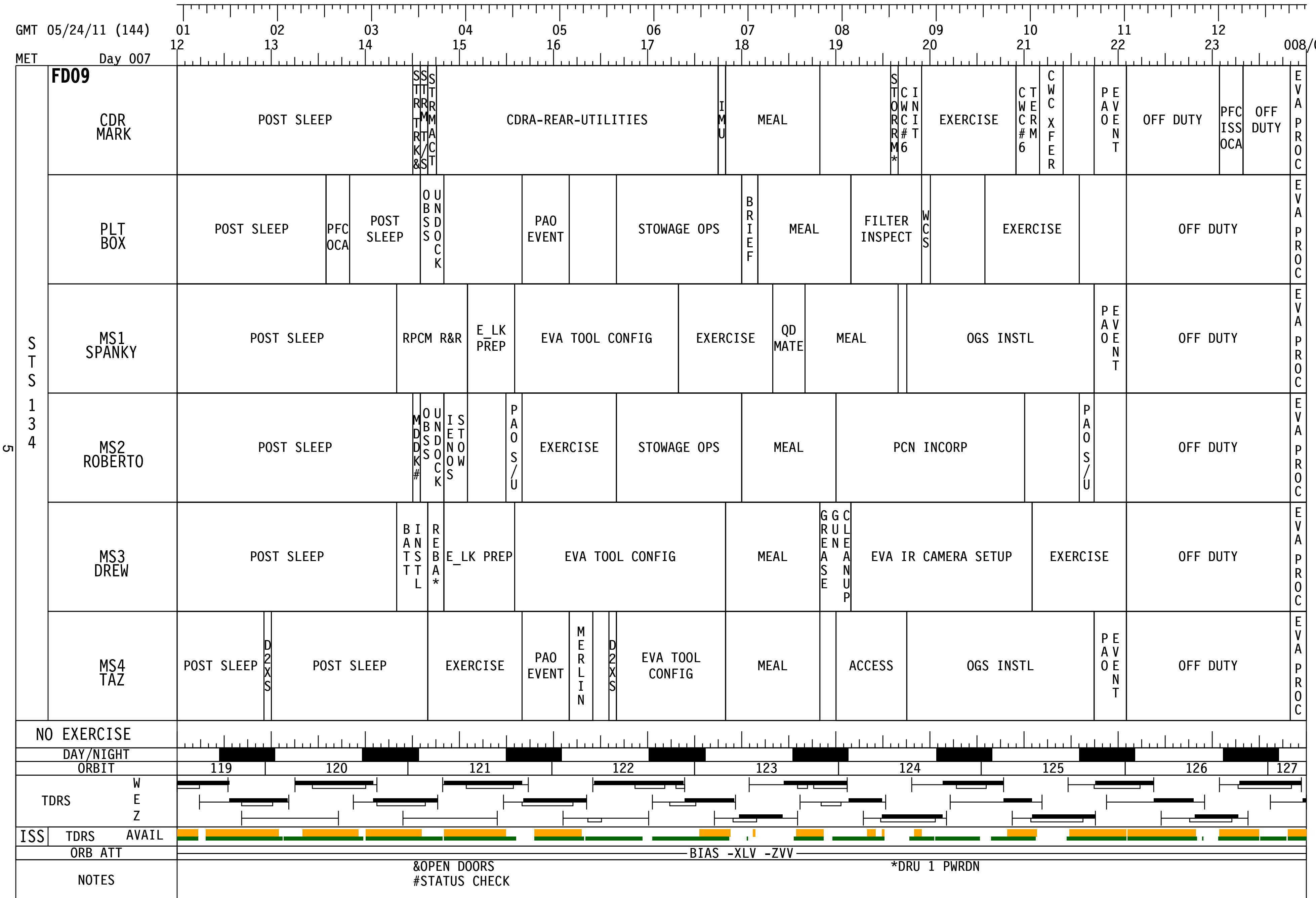
9. STS-134/ULF6 FD08 - MMT Summary
   The MMT met briefly today to review the orbiter systems and mission progress. Endeavour and her crew continue to perform in an outstanding fashion. The team is Looking forward to the upcoming undocking of the 25S Soyuz and the imagery capture that is planned for that event.

10. CDRA R&R
    Mark - For an overview of the CDRA Bed R&R, please reference MSG 097 (28-0013) Node 3 CDRA Bed 201 R&R Big Picture Words.

11. MERLIN
    Taz - Today you will be moving the contents of MERLIN (LAB1O4_B1) into MERLIN2 (LAB1O4_D1), removing the desiccants from MERLIN, and propping the door open so the unit can dry out prior to return on ULF-7. Any questions on this activity should be directed to Huntsville.

12. REPLACE PAGES 2-28, 2-30 AND 2-32, AND 3-90 THROUGH 3-99.


REPLANNED
GMT 05/23/11 (143)
MET Day 007
007/00
13 14 15 16 17 18 19 20 21 22 23 05/24
01 02 03 04 05 06 07 08 09 10 11 12
FD08
FD09
^25S UNDOCK
STS 134
CDR MARK
PLT BOX
MS1 SPANKY
MS2 ROBERTO
MS3 DREW
MS4 TAZ
OFF DUTY
PRE SLEEP
PMC A/G
SLEEP
POST SLEEP
EXERCISE
IMU
STR TRK*
OMS^
MDK#
PRESLP
PAO EVENT
OBSS%
LOG
NO EXERCISE
NO EXERCISE [A]
DAY/NIGHT
ORBIT
111 112 113 114 115 116 117 118 119
TDRS W E Z
ISS TDRS AVAIL
ORB ATT
BIAS -XLV -ZVV
25S
RM
BIAS -XLV -ZVV
NOTES
*CLOSE DOORS%MNVR SENSOR PROTECT
^ACCUM REPRESS
#STATUS CHECK
[A] NO EXERCISE [ISS MNVR]


GMT 05/24/11 (144)
01 02 03 04 05 06 07 08 09 10 11 12
MET Day 007
12 13 14 15 16 17 18 19 20 21 22 23 008/00
FD09
STS 134
CDR MARK
POST SLEEP
CDRA-REAR-UTILITIES
IMU
MEAL
EXERCISE
PAO EVENT
OFF DUTY
PFC ISS OCA
OFF DUTY
EVA PROC
PLT BOX
POST SLEEP
PFC OCA
POST SLEEP
OBSS
UNDOCK
PAO EVENT
STOWAGE OPS
BRIEF
MEAL
FILTER INSPECT
WCS
EXERCISE
OFF DUTY
EVA PROC
MS1 SPANKY
POST SLEEP
RPCM R&R
E_LK PREP
EVA TOOL CONFIG
EXERCISE
QD MATE
MEAL
OGS INSTL
PAO EVENT
OFF DUTY
EVA PROC
MS2 ROBERTO
POST SLEEP
OBSS
UNDOCK
PAO S/U
EXERCISE
STOWAGE OPS
MEAL
PCN INCORP
PAO S/U
OFF DUTY
EVA PROC
MS3 DREW
POST SLEEP
BATT
INSTL
REBA*
E_LK PREP
EVA TOOL CONFIG
MEAL
GREASE
GUN
CLEANUP
EVA IR CAMERA SETUP
EXERCISE
OFF DUTY
EVA PROC
MS4 TAZ
POST SLEEP
D2XS
POST SLEEP
EXERCISE
PAO EVENT
MERLIN
D2XS
EVA TOOL CONFIG
MEAL
ACCESS
OGS INSTL
PAO EVENT
OFF DUTY
EVA PROC
NO EXERCISE
DAY/NIGHT
ORBIT
119 120 121 122 123 124 125 126 127
TDRS
W
E
Z
ISS TDRS AVAIL
ORB ATT
BIAS -XLV -ZVV
NOTES
&OPEN DOORS
#STATUS CHECK
*DRU 1 PWRDN

REPLANNED

GMT 05/24/11 (144): 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 05/25 | 12

MET Day 008: 008/00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12

6

STS 134

FD09					**FD10**
CDR MARK	EVA PROC	PRE SLEEP | STRM D/A | OMS^ | PMC A/G	PRE SLEEP	SLEEP	POST SLEEP
PLT BOX	EVA PROC	ILON	PRE SLEEP	SLEEP	LOG | POST SLEEP
MS1 SPANKY	EVA PROC		PRE SLEEP	SLEEP	POST SLEEP
MS2 ROBERTO	EVA PROC	MDDK#	PRE SLEEP	SLEEP	LOG | POST SLEEP
MS3 DREW	EVA PROC		PRE SLEEP	SLEEP	POST SLEEP
MS4 TAZ	EVA PROC		PRE SLEEP	SLEEP	POST SLEEP

NO EXERCISE

DAY/NIGHT

ORBIT: 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135

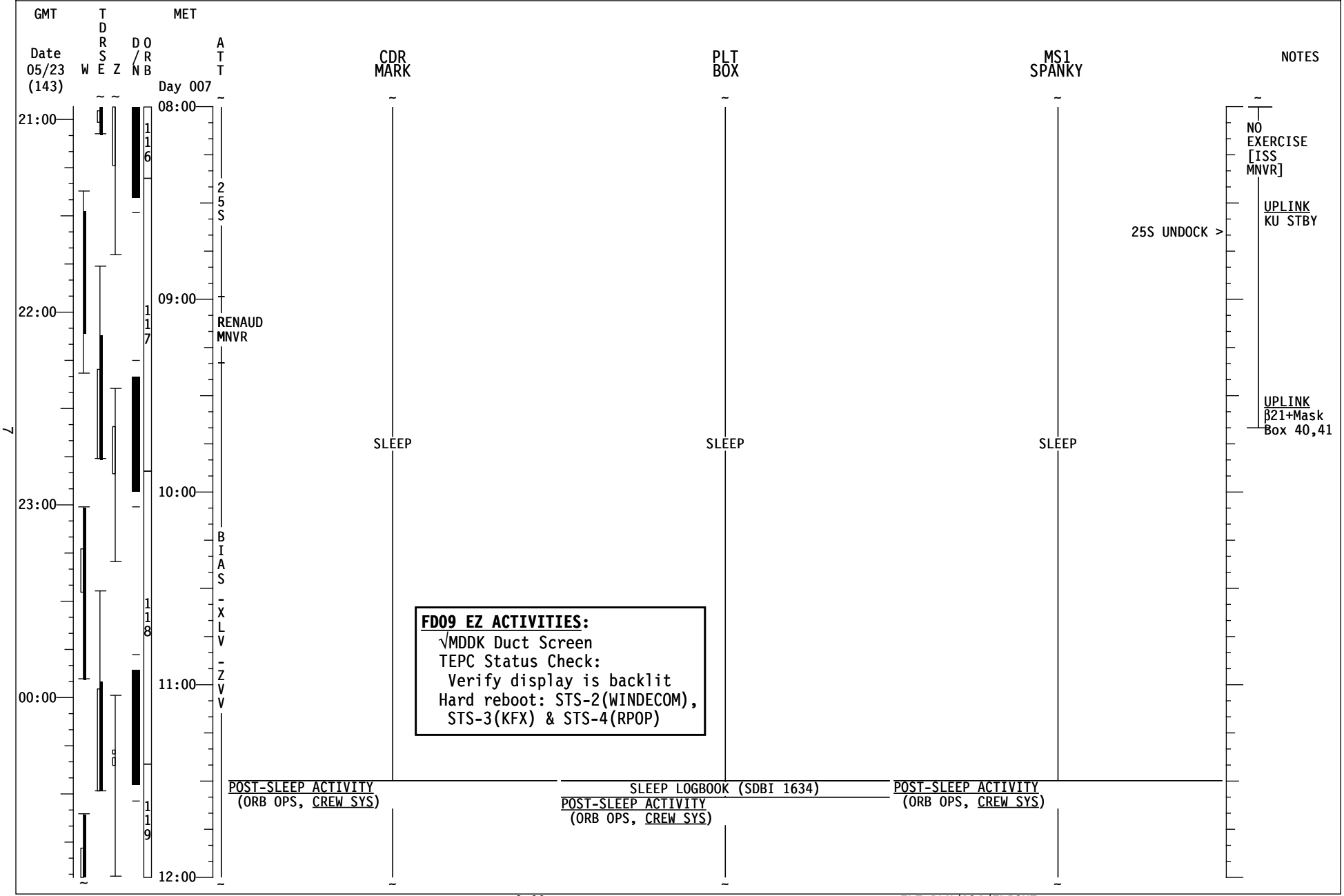
TDRS W E Z

ISS TDRS AVAIL

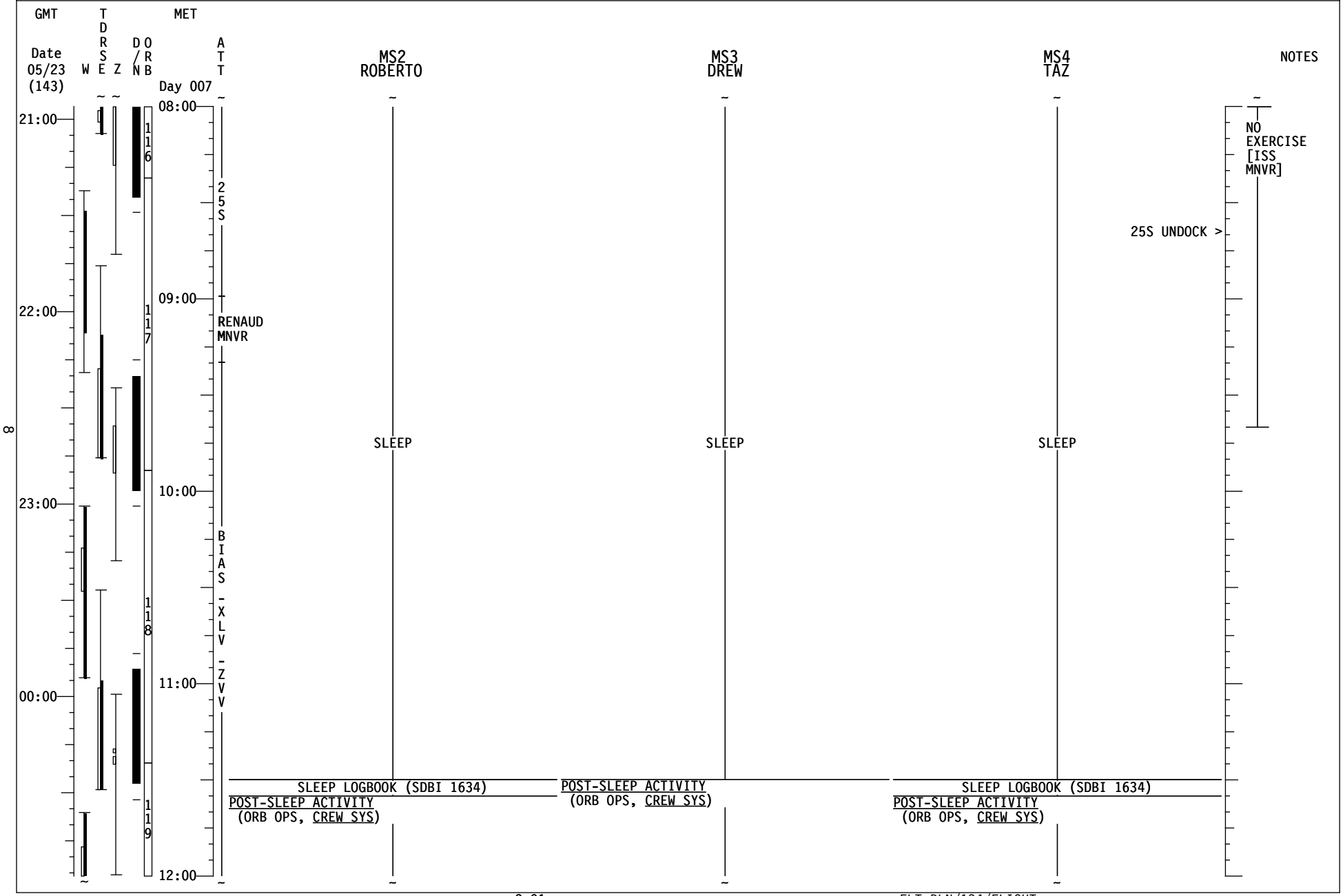
ORB ATT: BIAS -XLV -ZVV

NOTES:
^ACCUM REPRESS
#STATUS CHECK

STS-134/ULF6 FD09



STS-134/ULF6 FD09



STS-134/ULF6 FD09

GMT Date 05/24 (144) | MET Day 007 | TDRS W E Z | D/N | ORB | ATT

CDR MARK | PLT BOX | MS1 SPANKY | NOTES

01:00 02:00 03:00 04:00

12:00 13:00 14:00 15:00 16:00

ORB: 119 120 121

ATT: BIAS -XLV -ZVV

CDR MARK

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

OPEN STAR TRACKER DOORS Ref. MSG 074

STORRM CABLE TROUBLESHOOTING Ref. MSG 093

STORRM DAILY ACT (CC)

27-0387 CDRA DESSICANT/SORBENT BED 201
(NOD3A4 ARS RACK) (In CDRA Book)
Steps 2-6, 10.4, 10.5
Ref. MSG 097 for big picture words

PLT BOX

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

A L9 PAYLOAD STATION A/G (two) - OFF
NETMEETING VIDEO CONFERENCING (ORB OPS, PGSC)
Use A/G2 for audio
Inform MCC which PGSC will be used

Private Family Conference
KU TDRW (13:27-14:00) A

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

OBSS MNVR SENSOR PROTECT TO UNDOCK
Ref. MSG 075, pg. 7-10

PUBLIC AFFAIRS EVENT
STS KU AVAIL: 15:41-16:12
Shuttle FD: Box/Taz
Ref. MSG 091

MS1 SPANKY

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

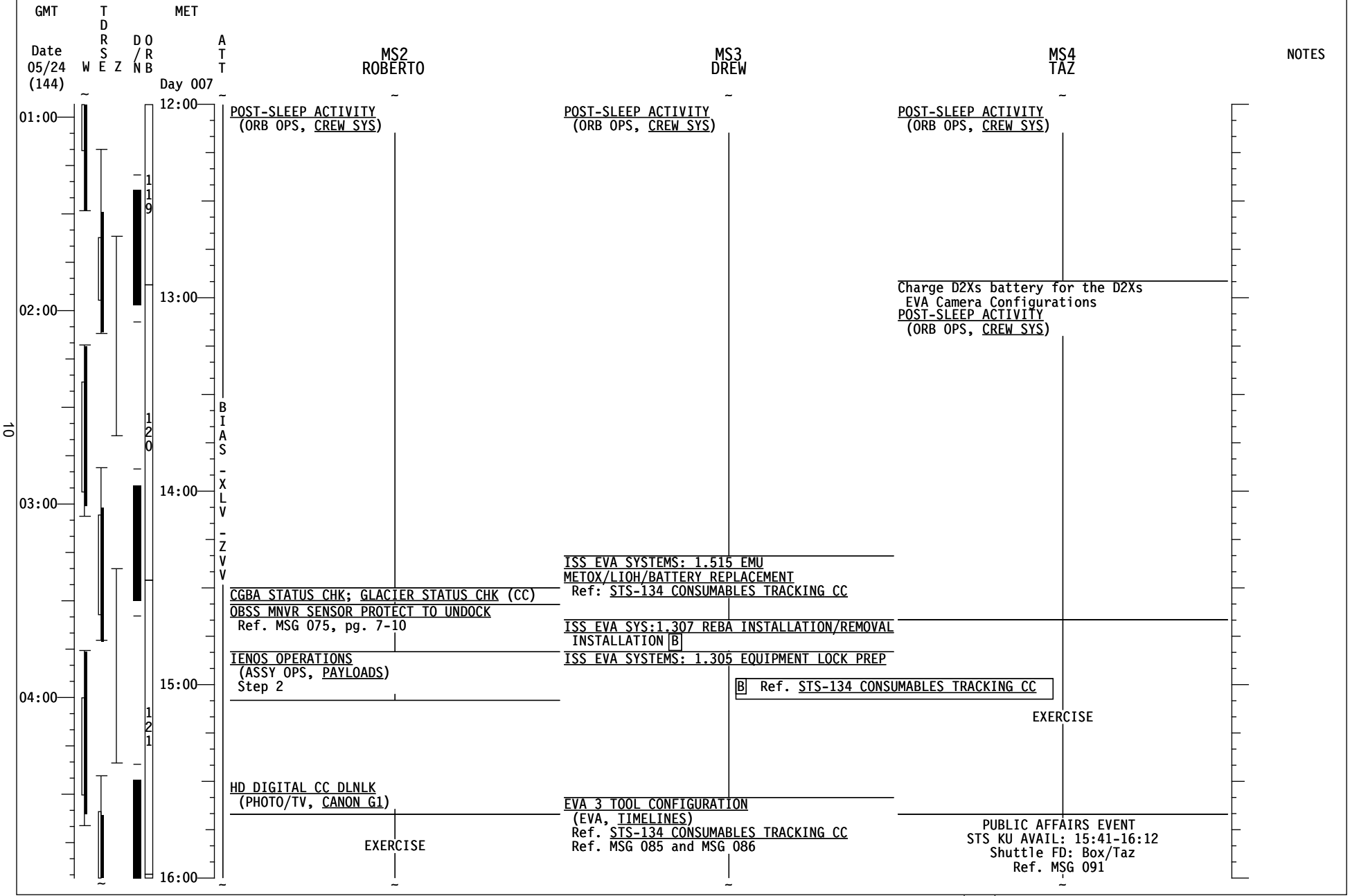
On MCC GO:
IFM: 3.2.405 RPCM R&R LAB1D2
MCC-H will perform steps 1.4 and 5.2

ISS EVA SYSTEMS: 1.305 EQUIPMENT LOCK PREP

EVA 3 TOOL CONFIGURATION
(EVA, TIMELINES)
Ref. STS-134 CONSUMABLES TRACKING CC
Ref. MSG 085 and MSG 086

6

STS-134/ULF6 FD09



STS-134/ULF6 FD09

GMT Date 05/24 (144) | TDRS W E Z | D/N | ORB | MET Day 007 | ATT | CDR MARK | PLT BOX | MS1 SPANKY | NOTES

GMT times: 05:00, 06:00, 07:00, 08:00
MET times: 16:00, 17:00, 18:00, 19:00, 20:00
ORB: 122, 123, 124
ATT: BIAS -XLV -ZVV

CDR MARK

27-0387 CDRA DESSICANT/SORBENT BED 201 (NOD3A4 ARS RACK) (In CDRA Book)
Steps 2-6, 10.4, 10.5
Ref. MSG 097 for big picture words

IMU STAR OF OPPORTUNITY ALIGN (ORB OPS,GNC)

MEAL

C Ref. MSG 049, Step 8
Power Down DRU1

STORRM ACT WITH DRU POWERDOWN C

SHUTTLE/ISS H2O CONTAINER FILL (HC)
(ORB OPS, ECLS) Perform CWC FILL #6
Ref. MSG 030

EXERCISE

PLT BOX

PUBLIC AFFAIRS EVENT
See pg. 3-92

STOWAGE OPS
Ref. MSG 079

STOWAGE BRIEF
Call down status to MCC via A/G 2

MEAL

FILTER CLEANING
(IFM, SCHEDULED MAINTENANCE)
Inspect filters and clean as necessary

D WCS Filter Check
WCS CRADLE - AUTO INIBIT
Inspect hose block filter, change if req'd
WCS CRADLE - AUTO

WCS FILTER CHECK D

MS1 SPANKY

EVA 3 TOOL CONFIGURATION
(EVA, TIMELINES)
Ref. STS-134 CONSUMABLES TRACKING CC
Ref. MSG 085 and MSG 086

EXERCISE

ECLSS: 1.912 OGS ACTIVATION - NODE 3
Steps 11 and 12

MEAL

OGS RECIRC LOOP CONTINUOUS REMEDIATION INSTALLATION
Steps 5-6
Ref. MSG 052

11

STS-134/ULF6 FD09

GMT Date 05/24 (144) | MET Day 007 | TDRS W E Z | D/N | ORB 12 123 124 | ATT BIAS-XLV-ZVV

MS2 ROBERTO

- 16:00 EXERCISE
- STOWAGE OPS
  Ref. MSG 079
- 18:00 MEAL
- FD09 ULF6 SODF WARNING PCN INCORP
  Ref. MSG 088

MS3 DREW

- EVA 3 TOOL CONFIGURATION
  (EVA, TIMELINES)
  Ref. STS-134 CONSUMABLES TRACKING CC
  Ref. MSG 085 and MSG 086
- 18:00 MEAL
- ULF6 EVA GREASE GUN CLEANUP
  Ref. MSG 084
- ULF6 EVA IR CAMERA FOR VADER IMAGERY
  Ref. MSG 086
  Ref. MSG 095 Steps 1-2

MS4 TAZ

- PUBLIC AFFAIRS EVENT
  See pg. 3-93
- US PODF: MERLIN: 6.012 MERLIN DESICCANT REMOVAL [E]
- Charge D2Xs battery for the D2Xs
  EVA Camera Configurations
- EVA 3 TOOL CONFIGURATION
  (EVA, TIMELINES)
  Ref. STS-134 CONSUMABLES TRACKING CC
  Ref. MSG 085 and MSG 086
- 18:00 MEAL
- OGS RECIRC LOOP CONTINUOUS REMEDIATION INSTALLATION
  Steps 2-4
  Ref. MSG 052
- OGS RECIRC LOOP CONTINUOUS REMEDIATION INSTALLATION
  Steps 5-6
  Ref. MSG 052

NOTES

[E] Remove dessicant packs from MERLIN in Locker-1 position. In step 7 relocate all internal items in MERLIN to MERLIN2. Stow the tray removed in step 2 per stowage note (MSG 096).

REPLANNED

STS-134/ULF6 FD09

GMT Date 05/24 (144) | TDRS W E Z | D/N | ORB | MET Day 007 | ATT

GMT	MET	ORB	ATT
09:00	20:00	124	
10:00	21:00	125	BIAS -XLV -ZVV
11:00	22:00		
12:00	23:00	126	
	00:00	127	

CDR MARK	PLT BOX	MS1 SPANKY	NOTES
EXERCISE		OGS RECIRC LOOP CONTINUOUS REMEDIATION INSTALLATION Steps 5-6 Ref. MSG 052	
SHUTTLE/ISS H2O CONTAINER FILL (HC) (ORB OPS, ECLS) Perform FILL TERMINATION	EXERCISE		
Transfer CWC to ISS			
PUBLIC AFFAIRS EVENT STS KU AVAIL: 21:46-22:14 Shuttle FD: Mark/Spanky/Taz Ref. MSG 092		PUBLIC AFFAIRS EVENT STS KU AVAIL: 21:46-22:14 Shuttle FD: Mark/Spanky/Taz Ref. MSG 092	
OFF DUTY	OFF DUTY	OFF DUTY	
Private Family Conference F ISS KU AVAIL (23:05-23:29)			
OFF DUTY			
EVA 3 PROCEDURE REVIEW See pg. 3-98	EVA 3 PROCEDURE REVIEW See pg. 3-98	EVA 3 PROCEDURE REVIEW See pg. 3-98	

F PFC to be performed using S-Band via Public Call 4 for audio and Ku-Band for video. Please call down SSC preference before the conference and make sure that all applications expcept Netmeeting have been closed.

13

STS-134/ULF6 FD09

GMT Date 05/24 (144) | TDRS W E Z | D/N | ORB | MET Day 007 | ATT

GMT	MET	MS2 ROBERTO	MS3 DREW	MS4 TAZ	NOTES
09:00	20:00	FD09 ULF6 SODF WARNING PCN INCORP Ref. MSG 088	ULF6 EVA IR CAMERA FOR VADER IMAGERY Ref. MSG 086 Ref. MSG 095 Steps 1-2	OGS RECIRC LOOP CONTINUOUS REMEDIATION INSTALLATION Steps 5-6 Ref. MSG 052	
10:00	21:00	HD DIGITAL CC DLNLK (PHOTO/TV, CANON G1)	EXERCISE	PUBLIC AFFAIRS EVENT STS KU AVAIL: 21:46-22:14 Shuttle FD: Mark/Spanky/Taz Ref. MSG 092	
11:00	22:00	OFF DUTY	OFF DUTY	OFF DUTY	
12:00	23:00	EVA 3 PROCEDURE REVIEW See pg. 3-99	EVA 3 PROCEDURE REVIEW See pg. 3-99	EVA 3 PROCEDURE REVIEW See pg. 3-99	
	00:00				

ORB: 124, 125, 126, 127

ATT: BIAS -XLV -ZVV

14

STS-134/ULF6 FD09

GMT Date 05/24 (144) | TDRS W E Z | D/N | ORB | MET Day 008 | ATT

GMT	ORB	MET	ATT
13:00	127	00:00	
14:00	128	01:00	BIAS -XLV -ZVV
15:00		02:00	
16:00	129	03:00	
		04:00	

15

CDR MARK

EVA 3 PROCEDURE REVIEW
Ref. EVA 3 BRIEFING CARD (EVA, TIMELINES)
Ref. MSG 085 and MSG 086

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

STORRM DAILY DEACT (CUE CARD)

L OMS ACCUMULATOR REPRESS G

L9 PS AUD A/G 1,2 (two) - OFF
PRIVATE MEDICAL CONFERENCE
Private Conference via A/G 2

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

G C3 OMS ENG LEFT - ARM/PRESS (Wait 5 Seconds)
- OFF

SLEEP

PLT BOX

EVA 3 PROCEDURE REVIEW
Ref. EVA 3 BRIEFING CARD (EVA, TIMELINES)
Ref. MSG 085 and MSG 086

ILLUMINATOR OPS (CC,TV) ILLUMINATORS ON-A,D

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

SLEEP

MS1 SPANKY

EVA 3 PROCEDURE REVIEW
Ref. EVA 3 BRIEFING CARD (EVA, TIMELINES)
Ref. MSG 085 and MSG 086

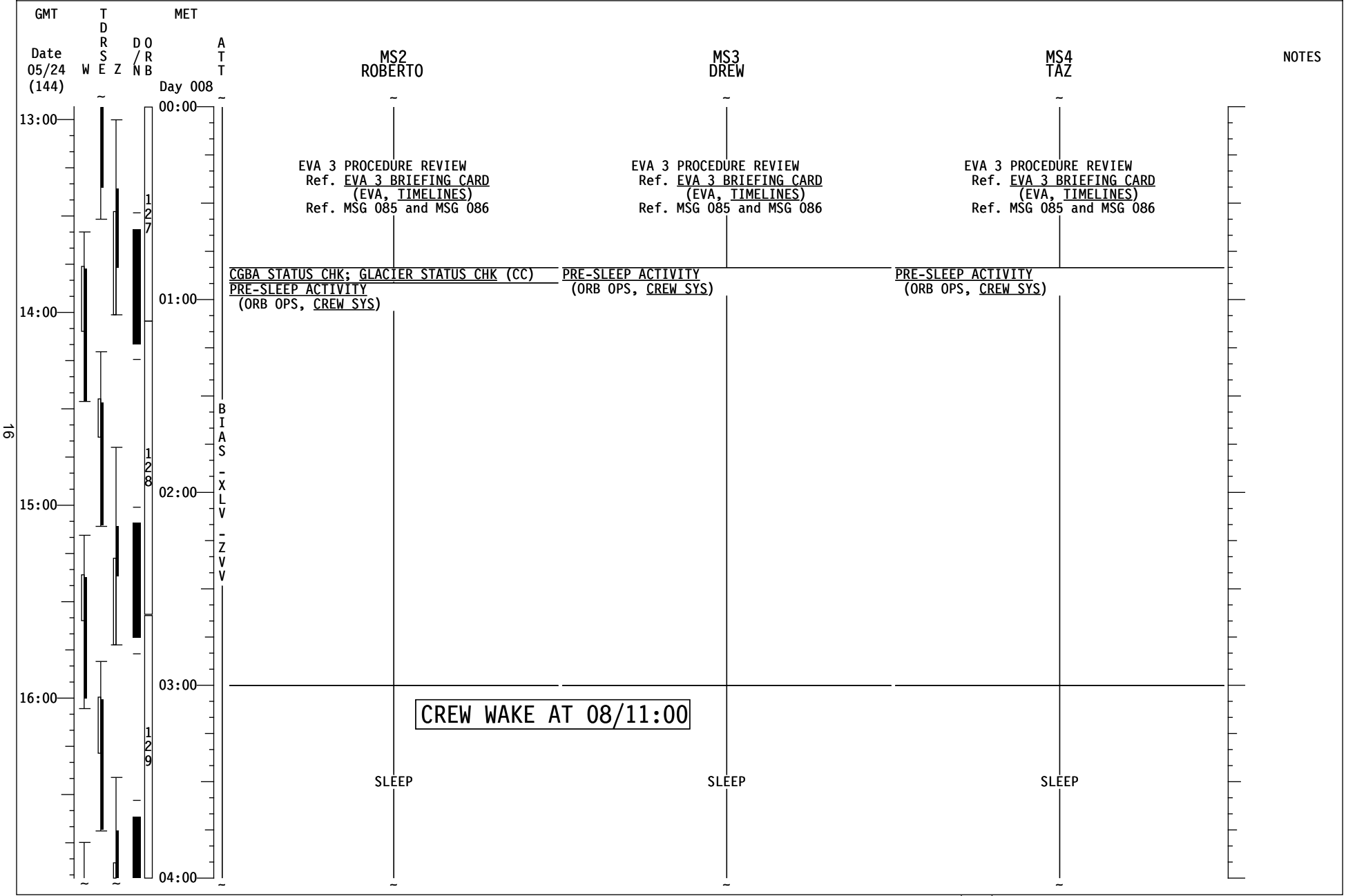
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

SLEEP

NOTES

CREW WAKE AT 08/11:00

STS-134/ULF6 FD09



MSG 083 - FD05 MISSION SUMMARY

You are guys are doing a great job and having a good time doing it, keep it up!

YOUR CURRENT ORBIT IS: 187 X 183 NM

NOTAMS -

EDW -	EDW 22L/04R IN USE. EDT 22R/04L EMERGENCY DAY USE ONLY.
EDW -	LAKEBED RWYS RED.
NOR -	LAKEBED RWYS GREEN.
HNL -	RWY 08R/26L CLSD
NTU -	RWY 05R/23L CLSD.
FFA -	NOT USABLE. IN CARETAKER STATUS.
LAJ -	RWY WIDTH REDUCED TO 154' - EAST SIDE OF RWY CLSD.
BEN -	NOT USABLE. NOT SUPPORTED.
IKF -	NOT USABLE. NO AGREEMENT

NEXT 2 PLS OPPORTUNITIES:

EDW22 ORB 126 – 7/22:57 SKC 7 240/12P19
EDW22 ORB 141 – 8/21:45 SKC 7 240/4P7

OMS TANK FAIL CAPABILITY:

NO

LEAKING OMS PRPLT BURN:

L or R OMS LEAK: ALWAYS BURN RETROGRADE

OMS QUANTITIES(%)

L OMS OX = 33.23 R OMS OX = 34.28
FU = 33.24 FU = 33.95

FOR CURRENT QTYS, SUBTRACT INCN'T COUNTER

DELTA V AVAILABLE:

OMS	346 FPS
ARCS (TOTAL ABOVE QTY1)	46 FPS
TOTAL IN THE AFT	392 FPS
ARCS (TOTAL ABOVE QTY2)	79 FPS
FRCS (ABOVE QTY 1)	32 FPS
AFT QTY 1	82 %
AFT QTY 2	44 %

END OF PAGE 1 OF 1, MSG 083

27-0604 (MSG 084) ULF6 EVA GREASE GUN CLEANUP

OBJECTIVE:
Clean EVA Grease Guns (Straight and J-hook Nozzle guns) and prep for stowage.

Big Picture: After gathering the hardware, this procedure has you clean the used Grease Guns and stow them in individual Ziploc bags. No disassembly of the gun is required. Then you will stow the Ziploc bags into the "Done" mesh bag.

DURATION:
20 minutes

PART 1: TOOL GATHER (00:10)

TOOLS:
Large Ziploc Bags 24-in x 24-in (four) - NOD2_O1, 1.0 CTB SN 1104, "Ziploc Pantry"
Dry Wipes (not EVA wipes) (two) - crew preference
Scissors - crew preference
Nitrile Gloves (one pair) as required - crew preference

PARTS:
Refer to Figure 1, 2.
Straight Nozzle Grease Gun Assy (two) P/N SED33120736-305 - A/L Deployed
- Straight Nozzle Grease Gun MLI
- Straight Nozzle Shutoff Valve
- Full Grease Gun Cartridge
- Hinge Restraint Ring

J-hook Nozzle Grease Gun Assy (two) P/N SED33120736-306 - A/L Deployed
- J-hook Nozzle Grease Gun MLI
- J-hook Nozzle Shutoff Valve
- Full Grease Gun Cartridge
- Hinge Restraint Ring

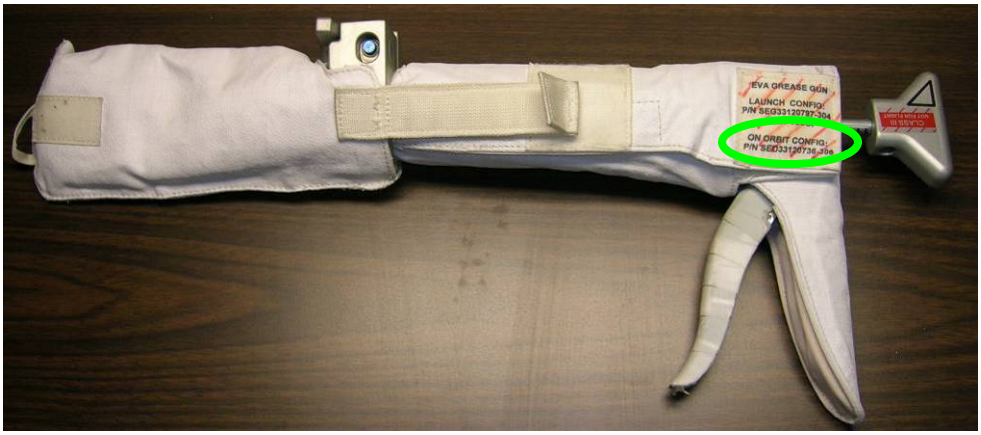


Figure 1. - Assembled J-hook Nozzle Grease Gun config Part Number location.

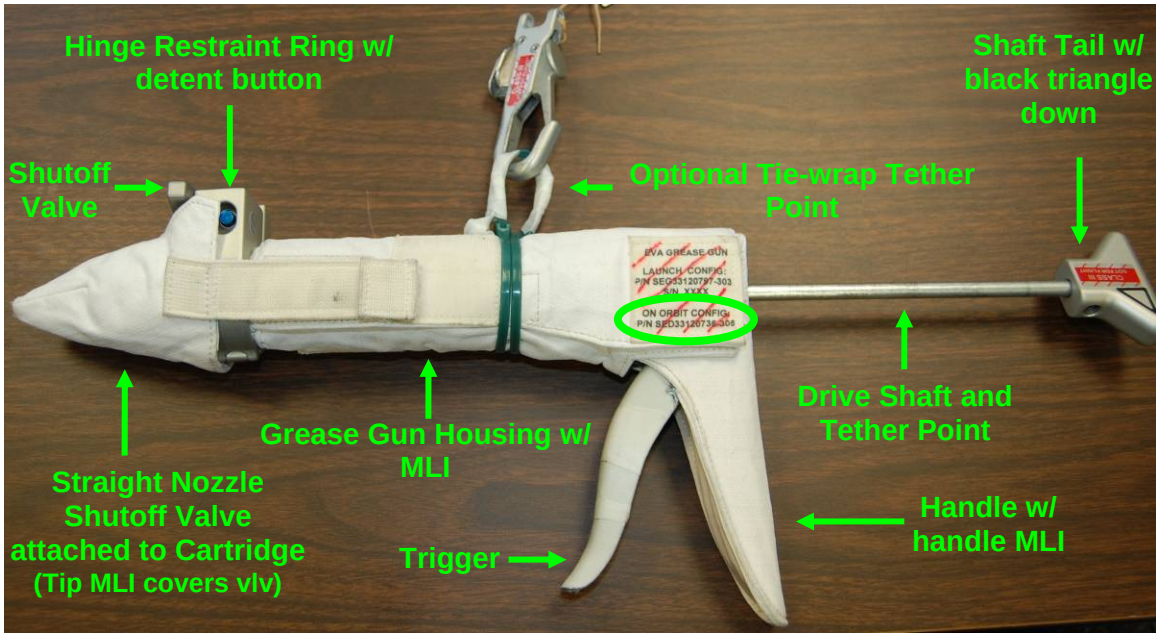


Figure 2. - Assembled Straight Nozzle Grease Gun Nomenclature.

PART 2: Grease Gun Cleanup and Stowage (00:10)

CAUTION
Excessive force against Drive Shaft will cause grease to leak rapidly through nozzle during the next EVA. Grease already has positive pressure due to off-gassing
Prevent inadvertent cutting/ slicing of MLI when removing the optional tether point

NOTE
The grease guns will be stowed assembled, therefore disassembly is not required. Removal of the grease gun MLI is not expected during the cleanup

1. Using Dry Wipes (not EVA wipes) with best effort, clean excess grease on Straight Nozzle Grease Gun with:
   Nozzle, Refer to Figure 3
   Inside and outside Tip MLI, Refer to Figure 4
   Housing and Handle MLI, Refer to Figure 2

2. Using Dry Wipes (not EVA wipes) with best effort, clean excess grease on J-hook Nozzle Grease Gun:
   Nozzle, Refer to Figure 3
   Inside and outside Tip MLI, Refer to Figure 4
   Housing and Handle MLI, Refer to Figure 2

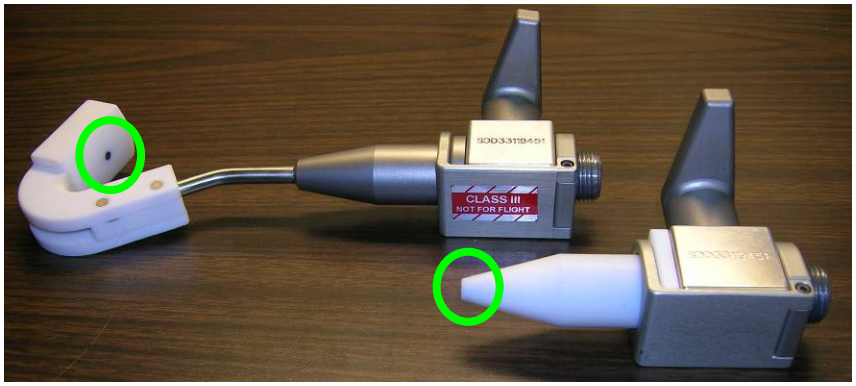


Figure 3. - J-hook and Straight Nozzle - Potential Excess Grease.

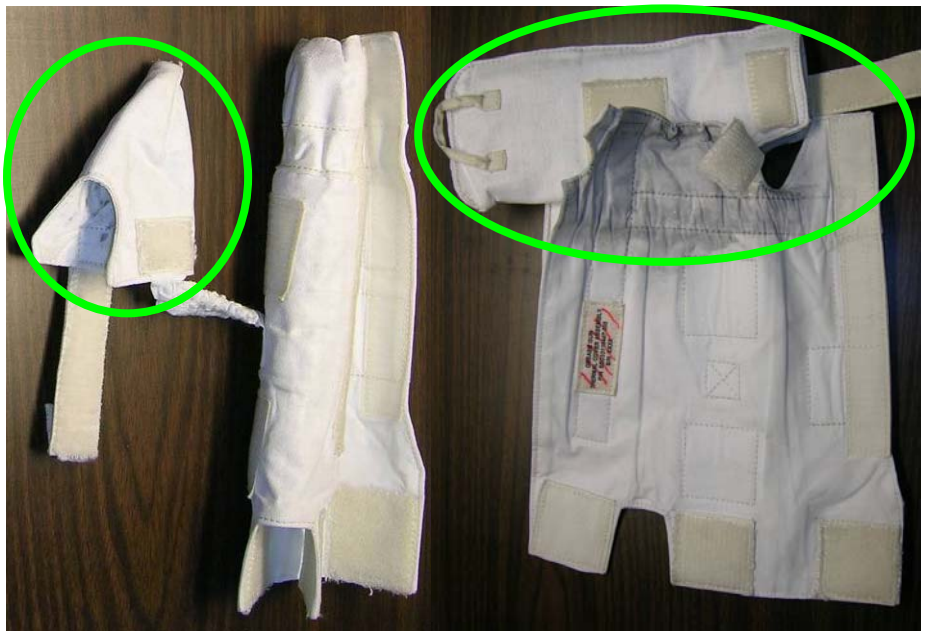


Figure 4. - J-hook and Straight Nozzle Tip MLI - Potential Excess Grease.

3. Using scissors, cut Optional Tether Point of Straight and J-hook Nozzle Grease Guns (one each) to remove zip ties, Refer to Figure 5

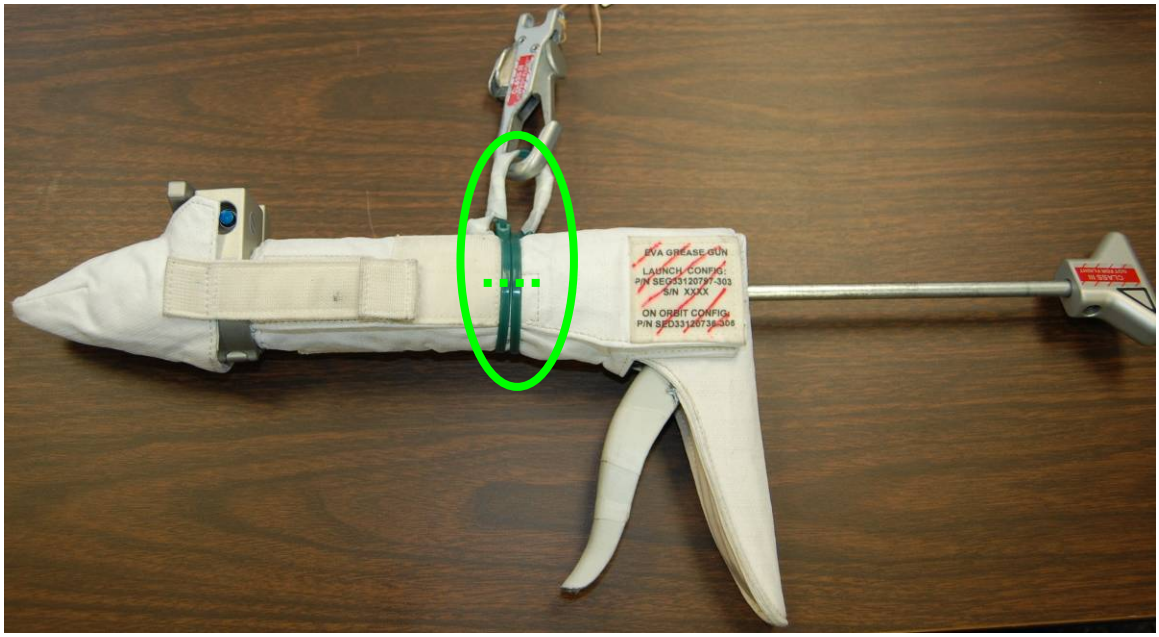


Figure 5. - J-hook and Straight Nozzle Optional Tether Point.

4. Verify the following for all four guns:
   Valve is closed (arrow perpendicular to nozzle)
   Hinge Restraint Ring is secured and rotated next to Valve handle
   Drive Shaft is slightly pulled aft to disengage plunger in cartridge
   Drive Shaft is Engaged (black triangle up)
   Grease Gun MLI fully installed with MLI tip installed on nozzle, Refer to Figure 1 and 2.

5. For each Ziploc Bag (total four), stow one Grease Gun

6. Stow the following hardware:
   Ziplocs (four) with Grease Guns → A/L Deployed, “Done” mesh bag
   Dry Wipes (not EVA wipes) (two) → discard item into common trash
   Nitrile Gloves (one pair) as required → discard item into common trash
   Scissors → crew preference

Mark, Drew, Mike, and Taz, thank you for all your hard work so far!!! We are excited for EVA 3.

We have a few deltas for **FD 9** activities:

EVA 3 Tool Config:

1) MSG 27-0006 (134-086) STS-134/ULF6 EVA3 TIMELINE UPDATES has your new EVA 3 Tool Config that replaces pages 7-110 and 7-111.
2) Post EVA 2, the SARJ MLI Cover #17 may be in your way. Stow it clear of crew activity in a 24x24 Ziplock bag (1.0 CTB Ziplock Pantry, NOD201) and Label Ziplock Bag "SARJ MLI Cover #17". Please empty contents of Small EVA Trash bags into a Ziplock Bag (1.0 CTB Ziplock Pantry, NOD201) and inventory. Label Ziplock bag SARJ COVER BOLTS and place in 'SARJ MLI COVER #17" Ziplock bag. Report inventory and stowage location to MCC-H.
3) We believe the VSC may have MLI p/n 51617-3002-1 still installed on it (ref bottom/right photo of FS 7-159). If so, please remove that MLI and stow it in the Done Mesh Bag. The VSC MLI (soft) that is referenced in the tool config has p/n 51617-0076-1 and has the straps to go over the VSC. This MLI should be in the EVA3 Tools Mesh Bag. The end config of the VSC and MLI should look like the top /left photo on page FS 7-159, with the straps secured over the VSC.
4) During EVA 1 and 2 it was reported that BRT Ballstacks felt 'loose'. MSG 28-0012 (134-089) BRT Ballstack Stiffness Adjustment Procedure contains the procedure steps to adjust the stiffness of the BRT Ballstack. If you desire to adjust your BRT and time permits during EVA Tool Config or EVA Procedure Review, it is okay to perform this procedure on one BRT at time. Please perform a verification test before starting the procedure on another BRT. If more time is required, Grease Gun Clean up can be deferred to a later date. Please let MCC-H know if this adjustment is performed.

EVA 3 Procedure Review:

5) Drew, Spanky and Taz - MSG 27-0006 (134-086) STS-134/ULF6 EVA3 TIMELINE UPDATES contain change out pages for the new EVA3 Procedure and additional pages for IR Imagery and EWC Cable Install.
   To update the EVA 3 procedure perform the following
   a. Cross Out pages FS 7-136 and FS 7-148 in the original procedure
   b. Remove pages FS 7-139 and FS 7-140
   b. Move pages FS 7-135 and FS 7-141 thru FS 7-146 to the get-ahead's tab
   c. Add highlights to the following in N/C/W:
      1. Page 7-119, ISS Truss Constraints C.1
      2. Page 7-119, ISS US Pressurized Elements Constraints A.7
      3. Page 7-121, ISS Generic Constraints D.4
      4. Page 7-121, ISS Truss Constraints A.6
   Complete the following steps using the pages in MSG 27-0006 (134-086)
   d. Replace pages FS 7-109 thru FS 7-112
   e. Replace pages FS 7-115 and FS 7-116
   f. Replace pages FS 7-125 and FS 7-126
   g. After page FS 7-134, Add pages FS 7-134a thru FS 7-134c (Includes FS 7-136 replacement)
   h. Replace pages FS 7-137 thru FS 7-139 (New FS 7-136 is on the back of FS 7-134c)

i. Add pages FS 7-139a and FS 7-139b (FS 7-139a is on the back of FS 7-139)
j. Replace pages FS 7-147 and FS 7-149 (New FS 7-147 is on the back of FS 7-139b)
k. Add FS 7-140 in the Get-Ahead section
l. Add pages FS 7-170a and FS 7-170b (IR Camera Task Data) after FS 7-170

E/L Prep:

6) Please make the following Shuttle FDF EVA Systems Pen & Ink change:
In STS-134 NOMINAL EMU SIZING (EVA, EMU CONT PROCS) for Fincke (FN), on page FS 12-28, update lower leg cam from 'Short' to 'Long'

Post EVA 2 Glove Photos:

7) The glove team has completed their review of the STS-134 photos downlinked post EVA #2 and all of the gloves used on EVA #2 are still GO for EVA with no constraints.

Suit Cleaning

8) To clean the grease off the EMUs, you can use dry wipes on the glove palm RTV and Huggies wet wipes on any fabric. Do not saturate or intentionally squeeze the liquid into the TMG fabric. Blot dry any wet areas using dry wipes. Both wet and dry wipes can be found in PMM1P1_G. Dispose used wipes in wet trash.

Water Mitigation for EMU 3005

9) Taz – We think the large amount of water at the MWC, which is the coldest part of the water loop, was due to condensation and met rate. Swapping LCVGs would not stop a leak, because the MWC seals are on the HUT side. Your met rate should be lower on EVA #4 and that will help. Since you were comfortable during the entire EVA, we recommend not changing anything. However, if you want to try your backup LCVG, it's your call. You would need to remove your biomed signal conditioner and sternal harness from the prime and install it in the backup. Please let us know what you decide.

EVA 3 EMU Prebreathe:

10) Taz, Mark - please pen & ink the following steps in US SODF; EVA: EVA Systems: 2.330 ISLE EMU PREBREATHE (WITH DATA COLLECTION)
37a. On IR Camera, turn MASTER sw - ON (allow 30 sec for boot up)
❑ √LED - On
37b. Press and hold ENABLE for 5 sec
❑ √LED - Off

Post EVA:

11) Taz and Mark - please pen & ink the following steps in US SODF; EVA: EVA Systems: 1.240 POST EVA for EVA 3 only
34a. On IR Camera, turn MASTER sw - Off
❑ √LED – Off

EVA 3 SUMMARY TIMELINE

PET HR : MIN	IV/SSRMS	EV1 (Ft)	EV2 (Fn)	
00:00		EGRESS/SETUP (00:40) • Post Depress and Egress (00:15) • Setup (00:25)	EGRESS/SETUP (00:40) • Post Depress and Egress (00:15) • Setup (00:25)	00:00
		PDGF SETUP (00:30)	PDGF SETUP (00:30)	
01:00		RETRIEVE PAMA/PDGF (00:20)	RETRIEVE PAMA/PDGF (00:20)	01:00
		PAMA/PDGF INSTALL (00:15)	PAMA/PDGF INSTALL (00:15)	
		VSC INSTALL (00:30)	VSC INSTALL (00:30)	
02:00		NOD1/FGB CH 1/4 CABLE INSTALL (00:45)	NOD1/FGB CH 1/4 CABLE INSTALL (00:45)	02:00
03:00		LAB EWC CABLE INSTALL (01:00)	LAB EWC CABLE INSTALL (01:00)	03:00
04:00		NOD1/FGB CH 2/3 CABLE INSTALL (01:05)	NOD1/FGB CH 2/3 CABLE INSTALL (01:05)	04:00
05:00		PDGF AND FGB THRUSTER PHOTOS/CLEANUP (00:15)	FGB CLEANUP (00:15)	05:00
		STP-H3 IR IMAGERY (00:40)	HPGT FRGF MLI INSTALL (00:40)	
06:00	Get Aheads (in priority order) - FGB 1553 Data Cable Install (00:45, 2 EV) - STP-H3 Photos (00:20, 1 EV) - A/L Toolbox Tool Stow (00:30, 1 EV)	CLEANUP/INGRESS (00:30) • Cleanup (00:15) • Ingress and Pre-Repress (00:15)	CLEANUP/INGRESS (00:30) • Cleanup (00:15) • Ingress and Pre-Repress (00:15)	06:00
06:30				06:30

FS 7-109

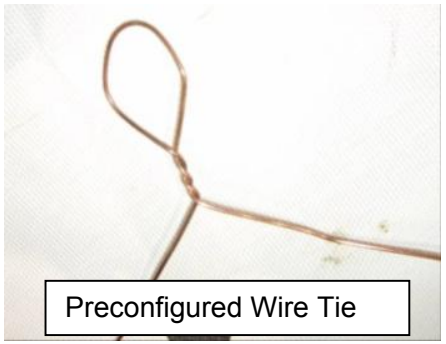
EVA 3 TOOL CONFIG

ISS Configuration:

MT @ WS5; CETA Carts Port/Stbd
SSRMS on MBS PDGF 2
SPDM on Lab
EV1 STP: S0 Port, outbd Strut → A/L Curved HR, fwd Stanchion
EV2 STP: S0 Port, inbd Strut → A/L aft D-ring

NOTE: Prior to use, inspect the following hardware:
- ❑ RET cords for fraying
- ❑ Inspect Load Alleviating Straps and D-ring Extenders; ref 2.230.100 CREW TETHER INSPECTIONS (SODF: ISS EVA TASKS):
  1. MMOD/general damage
  2. Discoloration
  3. Tack Stitching
  4. Red Band
- ❑ ISS Trash Bag: Bristle deformation/damage, after having stowed tools in trash bag
  √Empty √Zipper Closed
- ❑ BRT joint screws not loose
- ❑ Swing arm stiffness
- ❑ Remove PUMAA from PDGF
  PGT [B7 (25.5),CCW2,30.5] 11 turns
  Stow in EVA 4 Tools Mesh Bag
- ❑ Check alignment of Russian connector pins IVA (use cap tool) on both PDGF harness and 1553 cables

Tether Counts: (Green RETs)
RETs (sm-sm) = 15/16 RETs (PIP Pin) = 5/5
RETs (Lg-sm) = 7/8 Adj Equip Tethers = 7/10
Adj Equip Tethers (Lg-sm) = 2/2


Preconfigured Wire Tie

25

EV1

☐☐ MWS
- ☐☐ BRT (L)
  - ☐☐ RET (sm-sm)
  - ☐☐ Wire Tie (2 long, 2 short)
- ☐☐ T-Bar
  - ☐☐ RET (Lg-sm) (L)
  - ☐☐ RET (Lg-sm) (R)
  - ☐☐ Adj Equip Tether (R)
  - ☐☐ Adj Equip Tether (L to TB)
  - ☐☐ Small ISS Trash Bag (R, inbd)
- ☐☐ Swing Arm (R)
  - ☐☐ RET w/PIP Pin
  - ☐☐ **EVA Camera w/bracket** (int RET – morning of)

☐☐ D-ring Extender (1, L D-ring)
☐☐ Waist Tether (1, R on D-ring)

EV2

☐☐ MWS
- ☐☐ BRT (L)
  - ☐☐ RET (sm-sm)
  - ☐☐ Wire Tie (4 short)
- ☐☐ T-Bar
  - ☐☐ RET (sm-sm) (L)
  - ☐☐ RET w/PIP Pin (R)
  - ☐☐ Adj Equip Tether (R)
  - ☐☐ Adj Equip Tether (L)
  - ☐☐ Wire Tie (2, 1 around TB)
  - ☐☐ Small ISS Trash Bag (R, outbd)
    - ☐☐ PAMA 1 cap
    - ☐☐ PAMA 2 cap
    - ☐☐ PAMA 3 cap
- ☐☐ Swing Arm (R)
  - ☐☐ **EVA Camera w/bracket** (int RET – morning of)

☐☐ D-ring Extender (2, R & L D-ring)
- ☐☐ Waist Tether (R on D-ring Ext)
- ☐☐ Waist Tether (L on D-ring Ext)

A/L

☐☐ RET (Lg-Sm)
- ☐☐ **Med ORU Bag 4** (bottom to top)

External:
- ☐☐ Adj Equip Tether (RF soft tether pt to C/L bag door handle – taped hook)
- ☐☐ Adj Equip Tether (LB soft tether pt to C/L bag door handle – taped hook)
- ☐☐ 72" Gap Spanner fully extended (RB, RF soft tether pts with tether inside bag)

Internal:
- ☐☐ RET (sm-sm) (RB to Cable)
  - ☐☐ 1553 Cable (see fig 2)
    - ☐☐ 2 FPP Booties
- ☐☐ Fish Stringer (RB – other hook outside of bag)
  - ☐☐ Hook 1: Dust cap P18 – size 25
  - ☐☐ Hook 2: Dust cap P19 – size 25
  - ☐☐ Hook 3: FO video cable cap
  - ☐☐ Node 3 Terminator MLI
  - ☐☐ Node 3 Terminator MLI
  - ☐☐ Node 3 Terminator Cap
  - ☐☐ Node 3 Terminator Cap
  - ☐☐ 1553 P1 cap
  - ☐☐ 1553 P2 cap
- ☐☐ RET (Lg-sm) (LF)
  - ☐☐ VSC thermal cover (hard) (Velcro flaps folded up)
    - ☐☐ Russian Fixed tether (hooks thru tether, around VSC handle - ref photo on 7-131)
- ☐☐ RET (sm-sm) (LB)
  - ☐☐ VSC MLI (soft)
- ☐☐ RET (sm-sm) (LB)
  - ☐☐ VSC (inside VSC MLI)
- ☐☐ RET (sm-sm) (RF)
  - ☐☐ PGT [A7, CAL,30.5] s/n _____
    - ☐☐ PGT Battery s/n _____
    - ☐☐ 7/16 (wobble) Socket-6 ext
- ☐☐ RET (sm-sm) (from PDGF)
  - ☐☐ Grapple shaft cover
    - ☐☐ Wire Tie

☐☐ **Crewlock Bag 4** (attached to underside of Med ORU bag)
- ☐☐ Adj Equip Tether (Lg-sm) (ext – sm hook on R HR stanchion, Lg hook (taped) on Med bag)
- ☐☐ Wire Tie Caddy 4 (Int RET) (2 long, 7 short)
- ☐☐ RET (sm-sm)
  - ☐☐ PAMA Cheater Bar

FS 7-110

EVA 3 TOOL CONFIG (Cont)

A/L (Cont)

- ☐☐ Russian Ratchet Wrench (Int RET)
- ☐☐ RET (sm-sm)
  - ☐■ Long Wire Tie – preconfiged for MLI
- ☐☐ RET (sm-sm)
  - ☐☐ Long T-Handle Tool
    - ☐☐ Adj Equip Tether (Lg-sm) (sm hook to T-handle tool, Lg hook to D-ring)
- ☐☐ RET (sm-sm)
  - ☐☐ Short T-Handle Tool
- ☐☐ Loop Pin Puller (Int RET)
- ■☐ EWIS Cable

☐☐ RET (Lg-sm) (near Staging Bag)

- ☐☐ **Tool Stow C/L bag (bottom to top)**
  - ☐☐ Adj Equip Tether (external)
  - ☐☐ Fish Stringer
    - ☐☐ Hook 1: RET w/PIP Pin
      - ☐■ Pin Straightener Assy
      - ■☐ Large Cutters (GP)
    - ☐☐ Hook 2: RET w/PIP Pin
      - ☐■ Short MMOD T-handle
    - ☐☐ Hook 3: RET w/PIP Pin
      - ☐■ Short MMOD T-handle
    - ☐☐ Hook 4: RET (sm-sm)
      - ☐■ Probe
    - ☐☐ Hook 5: RET (sm-sm)
      - ☐■ Vise Grips
    - ☐☐ Hook 6: RET (sm-sm)
      - ☐■ 1" QD Cap Removal Tool
  - ☐■ HPGT FRGF MLI (Int RET – to MLI tether w/"T")
    - ☐☐ Long Wire Tie (around MLI – smushed loop around MLI tether)

☐☐ RET (Lg-sm) (foot 1 – Airlock D-ring ext)

- ☐■ **PAMA/PDGF/Harness** (see fig 3)
  - ☐■ RET (sm-sm)
    - ☐■ Grapple shaft cover
      - ☐■ Long Wire Tie
  - ☐■ Dust Cover 1 (pre-installed on power cables)
  - ☐■ Dust Cover 2 (pre-installed on power cables)
- ■☐ Node 3 Cable Bag (FGB Y-Cables)

A/L (Cont)

☐☐ RET (Lg-sm)

- ☐☐ EVA IR Camera

☐☐ **Staging Bag**

- ☐☐ Fish Stringer Tether
  - ☐☐ Wire Tie Caddy (hook 1) (5 short, 4 long)
  - ☐☐ Velcro/Tape Caddy (hook 2)
  - ☐☐ PGT (hook 3) s/n _____
    - ☐☐ PGT Battery s/n _____
    - ☐☐ 7/16 (wobble) Socket-6 ext
  - ☐☐ Ratchet Wrench (hook 5)
    - ☐☐ 7/16 (rigid) Socket-2 ext
  - ☐☐ Long Duration Tie-Down Tethers (2) (hook 6)
  - ☐☐ **Russian Ratchet Wrench** D (hook 7)
  - ☐☐ Spare Safety Tether Pack (85-ft + 85-ft) (to strap)
- ☐☐ Fish Stringer Tether
  - ☐☐ Connector Cleaner Tool Kit (hook 2)
  - ☐☐ Pry Bar (hook 4)
  - ☐☐ **Needle Nose Pliers** (hook 6)
  - ☐☐ **Russian Adjustable Tether** (2) (for tie down) D
  - ☐☐ **Russian Fixed Tether** (for tie down) D
  - ☐☐ MWS Key Strap Assy (on wire tie, to strap)

A/L (Cont)

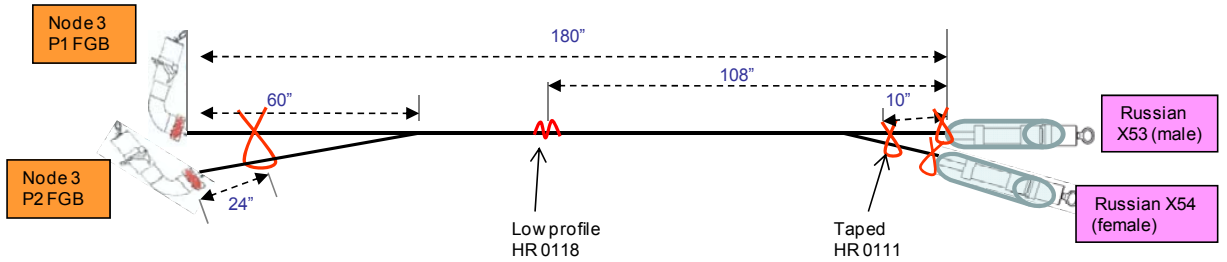
☐☐ **IV Bag**

- ☐☐ Towels (2)
- ☐☐ Contamination Detection Kit
- ☐☐ GP Caddy (2)
  - ☐☐ Adjustable Thermal Mittens (2)
- ☐☐ Socket Caddy (hatch cont) w/RET (sm-sm) (Black)
  - ☐☐ 1/2 Socket-8 ext
  - ☐☐ 7/16 (wobble) Socket-6 ext (spare)
- ☐☐ DCM Plug (SAFER Hardmount) (2)
- ☐☐ RET (sm-sm, Black) (2)

ISS External:

☐■ **Node 3 Cable Bag (FGB Y-Cables)**

- ☐■ NOD1/FGB Ch 1/4 Cables (see fig 4)
- ☐■ NOD1/FGB Ch 2/3 Cables (see fig 5)



- ❑ Attach short wire tie at low profile location
  - ❑ Attach short wire tie on X53 cable/connector
    - ❑ Twist one remaining end of wire tie around cap tether point
    - ❑ Twist other end of wire tie around bootie tether point
  - ❑ Attach short wire tie on X54 cable/connector
    - ❑ Twist one remaining end of wire tie around cap tether point
    - ❑ Twist other end of wire tie around bootie tether point
- ❑ Attach taped short wire tie around both Russian cables
- ❑ Attach short wire tie around both Node 3 cables
- ❑ Coil Node 3 end toward Russian end 3 loops – twist Node 3 wire tie around coils
  - ❑ Continue coiling Node 3 end – twist taped wire tie (Russian) around whole bundle

Figure 2: 1553 PDGF Cable

FS 7-111

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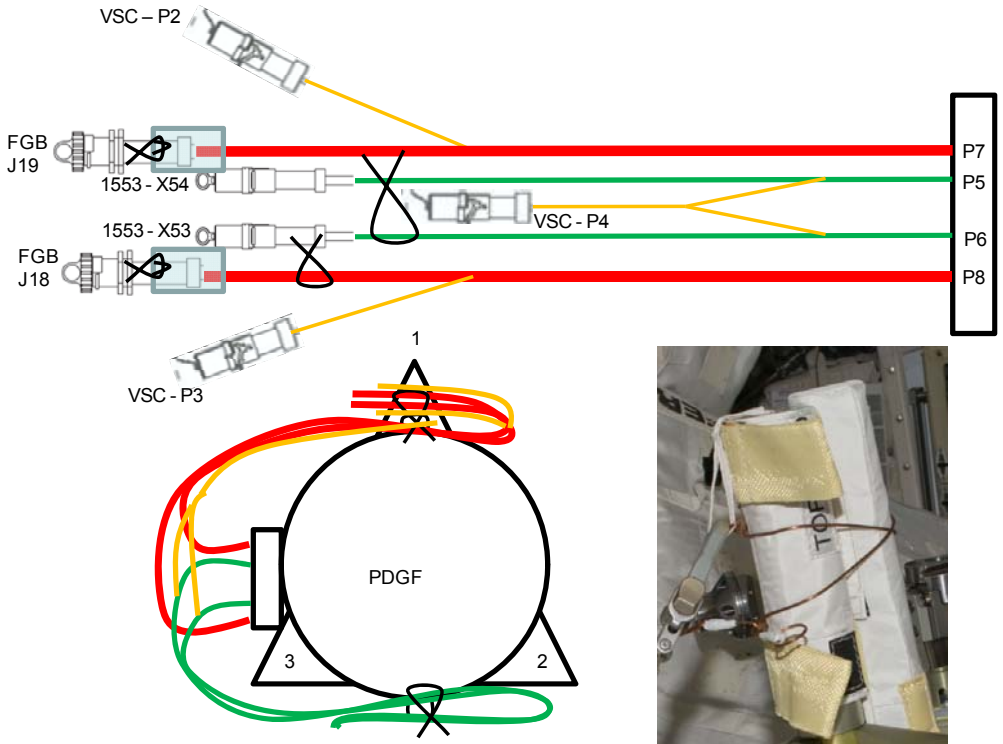
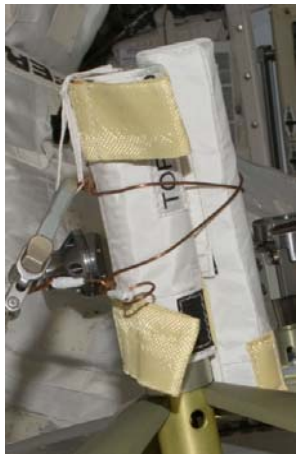
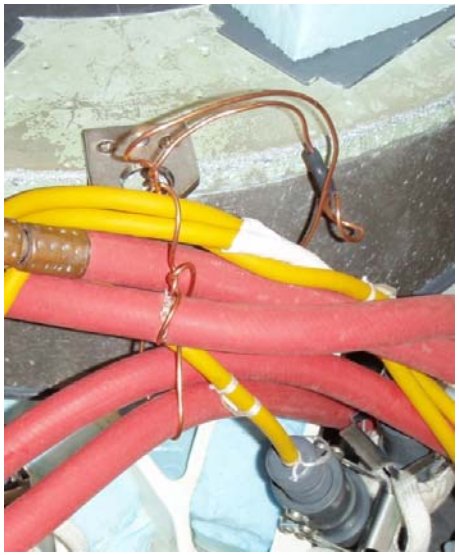
EVA 3 TOOL CONFIG (Cont)







- ❑ Attach long wire tie (both ends smushed) on J18
- ❑ Attach long wire tie (both ends smushed) around both X53 and X54
- ❑ Attach short wire tie to dust cover tether pt, then wrap around J18 connector
- ❑ Attach short wire tie to dust cover tether pt, then wrap around J19 connector
- ❑ Coil cables as shown/described:
  - ❑ Wrap J18 wire tie around all VSC and Power cables – one end of wire tie through PDGF tether point, then twist with other end of wire tie
  - ❑ Wrap 1553 wire tie around both cables – one end of wire tie through PDGF tether point, then twist with other end of wire tie
    - ❑ Twist end not going through PDGF tether point through both cap tether points of Russian connectors
- ❑ Attach long wire tie to grapple shaft cover tether point, then around both covers (should already be configured)

Figure 3: FGB PDGF Harness

EVA 3 INHIBIT PAD

Orbiter

ALL EVAs

TCS *(Not required, switch guard installed on EVA 1)*
IV L12 1. √TCS POWER – OFF

Ku-Band Antenna *(INCO: Prior to Egress)*
MCC-H 1. √KU-BAND Mask – active
2. √KU-BAND EVA Protect Box – active

RCS *(Not expected since not translating to Payload Bay)*
If EV crew < 27 ft from FRCS
IV 1. √DAP: VERN, FREE, LO Z
O14,15,16 2. √RJDF F1, F2, F3, F4 MANF DRIVER (four) – OFF
LOGIC (four) – OFF
MCC-H 3. √Above RCS config
IV 4. √RCS F – ITEM 1 EXEC (*)
√JET DES F1U – ITEM 17 (*)
F3U – ITEM 19 (*)
F2U – ITEM 21 (*)

Ground

ALL EVAs

Ground Radar *(TOPO: Prior to Egress)*
MCC-H 1. √TOPO console, ground radar restrictions in place for EVA

USOS (1)

ALL EVAs

PCU *(PHALCON: Prior to Egress)*

NOTE
PCUs may require up to a 1-hr warmup period before they are operational

MCC-H 1. √PCUs (two) operational in discharge mode and one of the following:
a. CCS PCU EVA hazard control FDIR enabled
b. Only allowed arrays unshunted and oriented < 105º from velocity vector
If one or both PCUs failed
2. Only allowed arrays unshunted and oriented < 105º from velocity vector

CUCU *(Crew: Prior to Egress)*
IV – (LAB1O4)
1. √cb POWER A, B [two] – OPEN
2. √cb LINK 1,2 [two] – OPEN

And one of the following inhibit pairs:
POIC 3a. Express Rack 2 Locker 6 – Power Removed
3b. Express Rack 6 Locker 7 – Power Removed
OR
IV 4a. Express Rack 2 Locker 6 – OFF
4b. Express Rack 6 Locker 7 – OFF

MISSE 8 *(POD: Prior to Egress)*
POIC Prior to EV Hatch Open
1. ELC-2 ExPA-2 Discrete Channel 6 – Disabled

JEM (1)

ALL EVAs

ICS-EF Antenna *(Prior to Egress)*
SSIPC 1. ICS MOD – OFF
2. ICS UPC – OFF
3. ICS HPA – OFF
4. HPA ON and UPC ON commands are cleared (not present) in the ICS stored command queue

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EVA 3 INHIBIT PAD (CONT)

LOCATION DEPENDENT INHIBITS

Lab Window *(Not expected)*
IV — If EV crew less than 10 ft from window or in window FOV, close window shutter

Cupola Windows *(Not expected)*
IV — If EV crew less than 10 ft from window, coordinate shutter opening/closing with EV crew and minimize time shutter is open

Mobile Transporter *(ROBO: Prior to Egress)*
MCC-H — If EV crew < 1.5 meters from MT
1. √MT latched

Port SARJ *(PHALCON: Prior to Task – STP-H3 and HPGT MLI)*
MCC-H — If EV crew working within 2 ft, outboard of SARJ or reqd per loads FR
1. √DLA (1) – LOCKED
2. All motor setpoints set to zero
3. All motors deselected

SSPTS *(PHALCON: Prior to Task – FGB stbd Y-jumper install, EWC Cable Install Inhibit 1 not required, inhibits 2 and 3 from ~2:30 – ingress)*
MCC-H — If EV crew working within 2 ft of SSPTS cables
1. RPCM LA2A3B D RPC 1 – Open, Close Cmd Inhibit
2. RPCM Z14B A RPC 2 – Open, Close Cmd Inhibit
3. RPCM Z13B A RPC 2 – Open, Close Cmd Inhibit

FPMU *(PHALCON: Prior to Egress – ELC3 Tasks)*
MCC-H — If EV crew on Port truss (P1-P6) or working within 5 ft of Floating Potential Measurement Unit
1. RPCM P11A_B RPC 13 Open/Close Cmd Inhibit

MISSE 8 *(POD: Prior to Egress – STP-H3 Imagery)*
POIC — If EV crew working zenith of plane of MISSE 8
1. MISSE-8 PASCAL solar cells – Zero voltage bias
2. ELC-2 ExPA-2 Discrete Channel 1 – Disabled
3. ELC-2 ExPA-2 28V Operational Power – Disabled

COL (1)

ALL EVAs

HAM Radio *(Crew: Prior to Egress)*
IV — 1. HAM Radio – Deactivate

USOS (2)

TASK SPECIFIC

Ch 1/4 FGB Power Cable *(PHALCON: Prior to Egress for RACU)*
MCC-H
1. √RACU-6 – OFF
2. √RACU-5 – OFF

P17 (port Y-jumper, CH 1/4) – *prior to task*
1. ARCU 51 – ON
2. ARCU ~~52,~~ 53 and 54 – OFF
3. CHT 21 and 22 – OFF
4. CHT 23 and 24 – ON
5. RPCM Z14B_A RPC1 – Open, Close Cmd Inhibit
6. RPCM LA1A4A_F RPC2 – Open, Close Cmd Inhibit
7. Either DDCU LA1A or LA4A Conv – Off

P16 – *prior to task*
1. MBSU-2, RBI-5 – Open, Close Cmd Inhibit

Ch 2/3 FGB Power Cable *(PHALCON: Prior to Egress for RACU)*
MCC-H
1. √RACU-6 – OFF
2. √RACU-5 – OFF

P20 (stbd Y-jumper, CH 2/3) – *prior to task*
1. ARCU 53 – ON
2. ARCU 51, 52 ~~and 54~~ – OFF
3. CHT 21 and 22 – ON
4. CHT 23 and 24 – OFF
5. RPCM Z13B_A RPC1 – Open, Close Cmd Inhibit
6. RPCM LA2A3B_D RPC4 – Open, Close Cmd Inhibit
7. Either DDCU LA2A or LA3B Conv – Off

P21 – *prior to task*
1. MBSU-4, RBI-5 – Open, Close Cmd Inhibit

Node 3 J1 FGB and J2 FGB 1553 (*ROBO: Prior to Egress*)
MCC-H — If any RWS active, cmd 'Active Assert Backup'

Lab EWIS Antennas *(CATO: During Task – EWC Antenna Install)*
MCC-H — RPCM LAD52B_A RPC 8 - Open, Close Cmd Inhibit
RPCM LA1B_H RPC 4 - Close Cmd Inhibit

SPDM *(ROBO: Prior to Egress)*
MCC-H — If EV crew translating or working on SPDM
1. √SPDM in Keep Alive configuration or Safed

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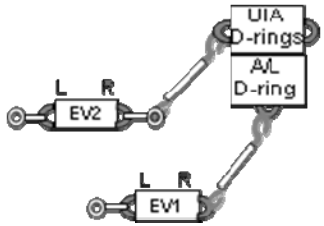
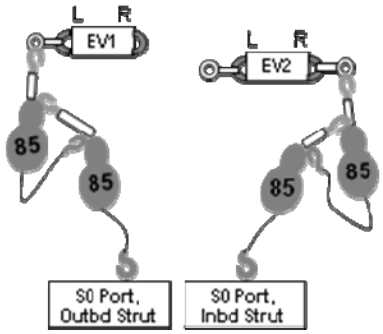
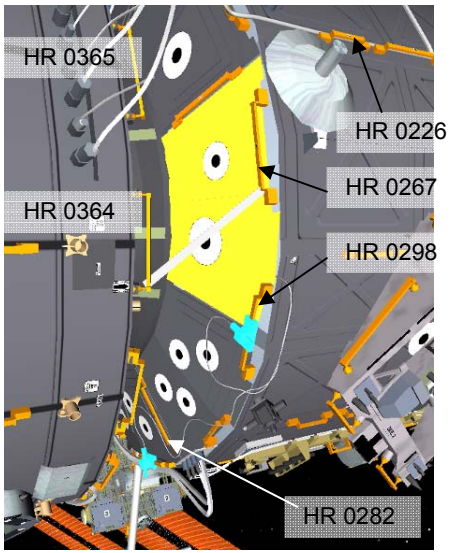
EVA 3 EGRESS/SETUP (00:40)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
1. Record PET Start time __:__	**Initial Configuration:**	**Initial Configuration:**
2. Day/Night Cycles _____	1. √All gates closed & hooks locked ❑ R Waist Tether to A/L int D-ring ext	1. √All gates closed & hooks locked ❑ R Waist Tether to UIA D-ring
	WARNING Avoid inadvertent contact with grapple fixture target, target pin, connector doors, and PDGF curvic coupling (teeth)	
3. Start WVS Recorders	EGRESS (00:15)	EGRESS (00:15)
4. Start Hatch Thermal Cover clock PET (30 min) __ : __	2. Open hatch thermal cover 3. Egress A/L (toward fwd curved HR)	1a. If IR Camera start-up steps not complete, turn MASTER sw - ON (allow 30 sec for boot up) ❑ √LED - On
5. Inspect Load Alleviating Straps for: 1. MMOD/general damage 2. Discoloration 3. Tack Stitching 4. Red Band	4. Perform LAS inspection on EV2 ST Pack (aft D-ring) ❑ LAS; ❑ √Yellow hook on Green ERCM ❑ LAS; ❑ √Green hook on Red ERCM	1b. Press and hold ENABLE for 5 sec ❑ √LED - Off
	5. RET to ST Pack 6. Attach **RED** hook to EV2 R D-ring ext ❑ √Gate closed, hook locked, reels unlocked, release RET 7. Give **EV2 GO** to release Waist Tether	2. Partially egress A/L hatch to allow EV1 to attach **RED** hook to R D-ring ext 3. On **EV1 GO**, release Waist Tether from UIA D-ring
	8. Perform LAS inspection on EV1 ST Pack ❑ LAS; ❑ √Yellow hook on Green ERCM ❑ LAS; ❑ √Green hook on Red ERCM 9. RET to ST Pack on fwd/stbd curved HR stanchion 10. Attach **RED** hook to L D-ring ext ❑ √Gate closed, hook locked, reels unlocked, release RET 11. Release R Waist Tether from A/L int D-ring ext	4. Relocate sm hook of Lg-sm RET to UIA D-rings 5. Egress A/L with ORU+C/L bag bundle 6. Attach ORU+C/L bag bundle on BRT w/RET

EVA 3 EGRESS/SETUP (00:40)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
6. Post crew egress: WVS Software: Select page – RF camera Sel 'Advanced Controls' S-Band Level (two) – Max	12. Perform buddy checks √MWS tabs up, BRT tab up, tether configs 13. Verify SAFER config ❑ √L handle down (MAN ISOL Vlv – Open) ❑ √R handle down (HCM – Closed) 14. √WVS – green LED	7. Perform buddy checks √MWS tabs up, BRT tab up, tether configs 8. Verify SAFER config ❑ √L handle down (MAN ISOL Vlv – Open) ❑ √R handle down (HCM – Closed) 9. √WVS – green LED
7. Stop Hatch Thermal Cover clock PET (30 min) __ : __	15. Close hatch thermal cover	
	CAUTION Avoid inadvertent contact with zenith PMA1 MDM and above 22" of EVA crane	
	WARNING Avoid contact with FGB sun sensors (possible sharp edges)	
	SETUP (00:25) 16. EV2 translate first, then translate aft/zenith on Crewlock to the Cable bag 17. Retrieve Cable bag, stow on BRT w/RET 18. Translate to FGB zenith/aft 19. Stow Cable bag across FGB HRs 1037 and 1032 (handle port) (Translate to PDGF worksite – PDGF Setup)	SETUP (00:25) 10. Translate to FGB/MRM1 interface ❑ Fairlead on E/L HR 0510 (zenith of trunnion pins) ❑ Fairlead on NOD1 HR 0119 (end cone radial HR) ❑ Translate nadir/port on PMA1 11. Attach **GREEN** hook to PMA1 HR 0013 ❑ √Gate closed, hook locked, reels unlocked, release RET 12. Release ORU bag taped hooks from C/L bag 13. Stow Medium ORU bag on PMA1 HRs 0011 and 0012 (hinge ISS fwd) 14. Install gap spanner on PMA1 HR 0010 and FGB vertical HR 1050 15. Remove C/L bag from ORU bag by releasing C/L bag taped hook from ORU bag 16. Stow C/L bag on MRM1 curved HR (Retrieve long wire tie – PDGF Setup)

LAB EWC CABLE INSTALL (01:00)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
Planned PET 03:00 1. Verify inhibits in place √ SSPTS inhibited  	CAUTION Avoid inadvertent contact with S0/Node 2 fluid tray hardlines at Node 2 end, which are limited to 25 lb OPEN MMOD SHIELD C2-01 (00:20) 1. Retrieve **GREEN** hook from Node 1 HR 0119 ❑ √Gate closed, hook locked, reels unlocked, release RET 2. Translate to Lab, zenith/port route ❑ Translate to Lab via S0 port struts ❑ Translate port/nadir using gap spanner to wkst 3. Release trunnion MLI from MMOD Shield C2-01 4. Verify EWIS Cable secured prior to releasing connectors, may need add adj tether b/ HR and EWIS Cable 5. Assess MMOD shield alignment and body positioning (Lab HR 0298 potential BRT) 6. Release Dzus fasteners, in any order ❑ Zenith ❑ Center ❑ Nadir 7. Give **EV2 GO**, open shield (clamshell) 8. Release nadir MLI Dzus fastener and peel back MLI to expose electrical connectors (attached w/Velcro)	OPEN MMOD SHIELD C2-01 (00:20) 1. Retrieve C/L bag from MRM, stow on BRT w/RET 2. Retrieve **GREEN** hook from PMA1 HR 0013 ❑ √Gate closed, hook locked, reels unlocked, release RET 3. Translate to Lab fwd, zenith/stbd route ❑ Translate to Lab via S0 stbd struts 4. Translate nadir/port to MMOD shield C2-01 using JEM HRs ❑ Fairlead on JEM or Node 2 5. Stow C/L bag on Node 2 HR 0300 6. Retrieve following tools from C/L bag: ❑ Long MMOD tool/RET/Lg-sm Adj ❑ Short MMOD tool/RET 7. Install long T-handle tool into MMOD shield C2-01 ❑ √Pull test 8. Attach Lg hook of adj equip tether from long T-handle to Node 2 HR 0364 9. Stow short T-handle tool on EOTP HR using attached RET 10. Assess MMOD shield alignment and body positioning (Lab HR 0267 potential BRT) ❑ Look at MMOD alignment landmarks 11. On **EV1 GO**, open shield (clamshell) while maintaining pressure into flanges to keep shield hinged

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LAB EWC CABLE INSTALL (01:00) (Cont)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
	NOTE Once inhibits are in place, Station UHF will no longer be in the Big Loop. Comm with EV crew will be via Shuttle A/G1. Loss of comm is possible. Will verify comm after SSSR deactivated. If no comm, EV1 re-establish comm by moving to line of sight with Orbiter Antenna (ISS nadir). Will give GO for steps 9 thru 14. Then EV1 will re-establish comm before continuing with MMOD shield closure	
2. Give **MCC-H GO** for SSSR (UHF) reconfiguration ***MCC-H:*** *Deactivate SSSR (UHF)* 3. On **MCC-H GO**, A1R AUD CTR SL A/G1 – ON 4. Perform Comm Check		
5. Give **EV1 GO** for EWIS connector ops	MATE P16A/J16A EWC CONNECTORS (00:15) 9. On **IV GO**, demate EWIS P16A from J16 (nadir most on lab endcone) 10. Demate EWIS J16A from P16 (free-floating cable) 11. Remove old EWIS cable from under MMOD shield and HR 12. Retrieve new EWC P16A and J16A cable, route under HR 13. Mate connector P16A (90° backshell) to J16 (lab endcone) ❑ √Good pins & EMI band; no FOD 14. Mate connector J16A to P16 (free-floating cable) ❑ √Good pins & EMI band; no FOD	MATE P16A/J16A EWC CONNECTORS (00:15) 12. Assist EV1 as reqd with MMOD Shield
6. When J16A and P16A mated, give **MCC-H GO** to activate SSSR (UHF) ***MCC-H:*** *Activate SSSR (UHF)* 7. On **MCC-H GO,** A1R AUD CTR SL A/G1 – OFF NOTE Big loop comm is via UHF	15. Stow/position cable so does not interfere with MMOD shield/MLI 16. 📁 WVS survey of connections under MLI	

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LAB EWC CABLE INSTALL (01:00) (Cont)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
	CLOSE MMOD SHIELD C2-01 (00:15) 17. Reinstall MLI Dzus fastener √Dzus alignment ❑ Rotate ccw until Dzus drops down onto spring ❑ Rotate Dzus to locked position cw, quarter turn ❑ Verify all MLI is beneath Dzus fastener plates 18. Install MMOD shield C2-01 19. Engage Center Dzus fastener √Dzus alignment ❑ Rotate ccw until Dzus drops down onto spring ❑ Rotate Dzus to locked position cw, quarter turn 20. Engage Dzus fasteners (❑ Zenith, ❑ Nadir) √Dzus alignment ❑ Rotate ccw until Dzus drops down onto spring ❑ Rotate Dzus to locked position cw, quarter turn	CLOSE MMOD SHIELD C2-01 (00:15) 13. Assist EV1 as reqd
	CLEANUP (00:10) 21. Mate new connector P1 to EWIS Ant 11 ❑ √Good pins & EMI band; no FOD 22. Re-install gap spanner from Node 2 HR 0365 to Lab HR 0267 (nadir stanchion) 23. RET to old EWIS cable and release all wire ties ❑ Stow any loose wire ties in trash bag	CLEANUP (00:10) 14. Install trunnion MLI over MMOD shield 15. Retrieve long T-handle tool/Lg-sm Adj/RET from shield 16. Retrieve short T-handle tool from EOTP 17. Stow T-handles (2) in C/L bag ❑ Short ❑ Long
8. Perform C/L bag inventory: **Crewlock Bag** ☐ Adj Equip Tether (Lg-sm) (ext) ☐ Wire Tie Caddy (Int RET) (2 long, 7 short) ☐ RET (sm-sm) ☐ PAMA Cheater Bar ☐ Russian Ratchet Wrench (Int RET) ☐ RET (sm-sm) ☐ RET (sm-sm) ☐ Long T-Handle Tool ☐ Adj Equip Tether (Lg-sm) ☐ RET (sm-sm) ☐ Short T-Handle Tool ☐ Loop Pin Puller (Int RET) ☐ EWIS Cable	24. Coil cable and use wire tie, if reqd 25. Stow EWIS cable in C/L bag 25a. Verify all cables are appropriately routed and wire tied to structure 26. WVS Survey 27. Glove Check	18. Perform C/L bag inventory 19. Wire tie P3/P4 cable to Lab HR 0268 and/or HR 0267 (BRT wire tie) 21. Verify all cables are appropriately routed and wire tied to structure 22. WVS Survey 23. Stow C/L Bag on BRT w/RET 24. Glove Check 25. Translate to A/L, retrieve fairlead 26. Stow C/L bag near A/L

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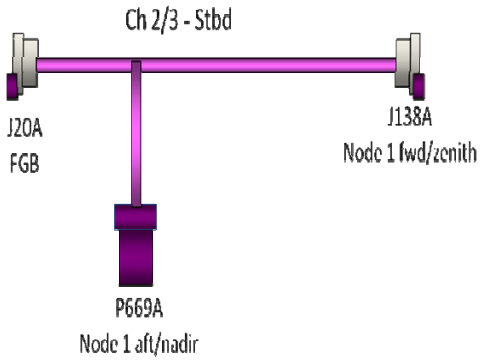
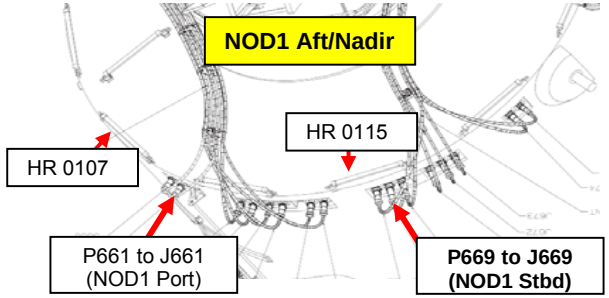
NOD1/FGB CH 2/3 CABLE INSTALL (STBD) (01:05)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
Planned PET 04:00 1. Verify inhibits in place: ~~√SSPTS Inhibited~~ √P19/P20/P21 Inhibited  	CAUTION Avoid inadvertent contact with PMA1 MDM and FGB Sun sensors. Ensure Safety Tethers are routed above all electrical connections CH 2/3 CABLE INSTALL (STBD) (01:05) ~~1. Translate to Node 1 stbd~~ ~~2. Retrieve **GREEN** hook from Node 1 HR 0119~~ ~~❑ √Gate closed, hook locked, reels unlocked, release RET~~ 3. Translate to FGB zenith, Node 3 Cable bag 4. Retrieve Stbd FGB Y-cable from bag (J20A) ❑ RET to cable before releasing Velcro strap 5. Untwist taped wire tie to release cable bundles 6. Transfer Node 1 fwd bundle (J138A) to EV2 7. Attach taped wire tie to PMA1 HR 0003 8. Retrieve nadir cable bundle (P669A) 9. Attach low profile wire tie to PMA1 HR 0001 10. Translate to Node 1 aft/nadir while routing cable ❑ Fwd to Node 1 aft endcone ❑ Nadir using aft endcone HRs 11. Wire tie cable to Node 1 HR 0113 12. Demate P669 from Node 1 J669; do not mate P669A ❑ P669 ←|→ NOD1 J669 13. Wire tie P669 and P669A connectors to Node 1 HR 0115  	CH 2/3 CABLE INSTALL (STBD) (01:05) ~~1. Translate to PMA1 nadir~~ ~~2. Retrieve **GREEN** hook from PMA1 HR 0013~~ ~~❑ √Gate closed, hook locked, reels unlocked, release RET~~ 3. Translate to FGB zenith from stbd side 4. Retrieve Node 1 fwd bundle (J138A) from EV1 CAUTION Avoid inadvertent contact with WETA antenna on NOD1 and spare SASA hi-gain and lo-gain antennas on Z1 stbd WARNING E/L HR 0537 has MMOD strike 5. Translate to Node 1 fwd endcone under Rat's nest while routing cable ❑ Fwd/stbd to Node 1 ❑ Fwd along E/L, over HPGTs ❑ Port onto Node 1 fwd endcone

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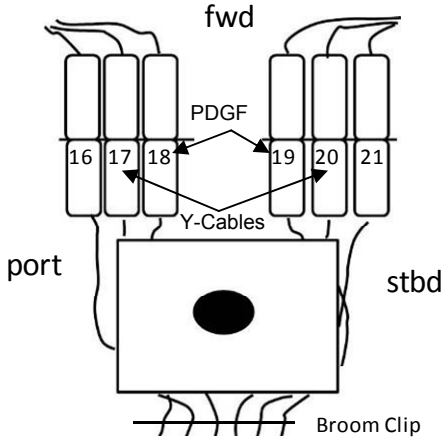
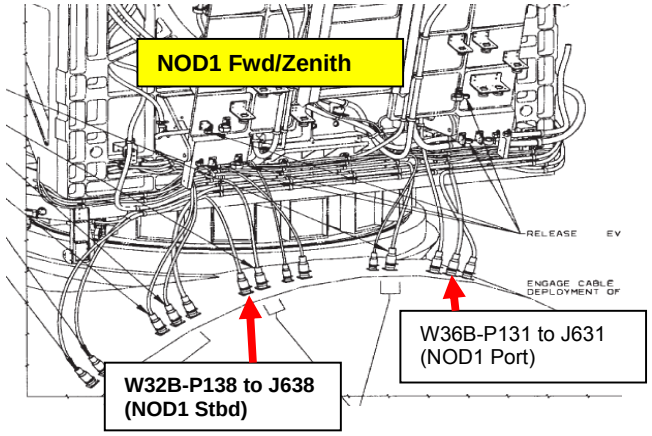
NOD1/FGB CH 2/3 CABLE INSTALL (STBD) (01:05) (Cont)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
	14. Translate to PMA1/FGB zenith connector panel	NOTE Best worksite position is inverted; Right hand on connector, Left hand on tray 6. Demate W32B cable connector P138 from Node 1 J638; do not mate P138A ❑ W32B P138 ←|→ NOD1 J638
2. ❑ P669 demated ❑ P138 demated Give **EV1 GO** for demate of P19 and 20  	15. On **IV GO**: Demate FGB P19 and P20 connectors from PMA1/FGB panel (zenith) ❑ FGB P19 ←|→ PMA1 J19 ❑ FGB P20 ←|→ PMA1 J20 16. Pull FGB P19 cable out from under SVS target ❑ Release cable (P21/P20) as reqd from broom clip to provide additional slack ❑ If need to demate P21, contact **MCC-H** 17. Remove cap from FGB Y-cable connector J20A 18. Mate stbd FGB cable connector J20A to FGB P20 ❑ √Good pins & EMI band; no FOD ❑ FGB J20A →|← FGB P20	7. Remove cap from FGB cable connector J138A 8. Install cap on Node 1 J638 9. Stand by for **IV GO** on connector mating ops 
3. ❑ P20A mated Give **EV2 GO** to mate J138A	19. Install cap on FGB J20 20. Route P19 cable port under FGB HR toward PDGF (HR 1030) 21. Remove MLI cap from PDGF harness connector J19 (lanyarded) 22. Mate PDGF harness J19 to FGB P19 ❑ √Good pins & EMI band; no FOD ❑ PDGF J19 →|← FGB P19 23. Move dust cover in place around mated connector; adjust wire tie as reqd ❑ Verify no metal portion of connectors is exposed	10. On **IV GO**: Mate FGB cable connector J138A to floating cable connector P138 ❑ √Good pins & EMI band; no FOD ❑ FGB J138A →|← P138 11. Wire tie cable at following HRs as translate back to PMA1: ❑ Node 1 HR 0130 (fwd/stbd – J138A wire tie) ❑ Node 1 HR 0122 (aft/stbd – low profile wire tie) (near Z1 pool handle) Position cable so that it is as flush as possible to Node 1 stbd ❑ Node 1 HR 0102 (low profile wire tie) ❑ PMA1 HR 0001 – any excess slack

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NOD1/FGB CH 2/3 CABLE INSTALL (STBD) (01:05) (Cont)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
	24. Retrieve caps from ORU bag Fish Stringer 25. Install caps on FGB J18 and J19 26. Translate nadir to Node 1 aft/nadir 27. Remove cap from FGB cable connector P669A 28. Install cap on floating cable connector P669 29. Mate FGB cable connector P669A to Node 1 J669 ❑ √Good pins & EMI band; no FOD ❑ FGB P669A →|← NOD1 J669	
4. On **EV1 GO**, give **MCC-H GO** to power up FGB Ch 2/3 and P19	30. **Notify IV**, complete with Ch 2/3 and FGB P19 connector ops 31. Wire tie cable at following HRs as translate back to PMA1: ❑ Node 1 HR 0113 (low profile wire tie) 32. Glove Check (Translate to PAMA/PDGF – Cleanup and Photos)	12. Glove Check ~~(Translate to A/L – Tool Stow)~~ (Translate to PAMA/PDGF – Cleanup)

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FGB AND PDGF PHOTOS/CLEANUP (00:15)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
Planned PET 04:05	CAUTION Avoid inadvertent contact with grapple fixture shaft	
	PHOTOS/CLEANUP (00:15) 1. Translate to PAMA/PDGF, zenith PMA route 2. Time Permitting: Take photos of the following FGB Thruster areas, as daylight and worksite access permit: ❑ Entire FGB port thruster cluster: Multiple angles ❑ Individual thrusters: Exterior cone ❑ Individual thrusters: Interior nozzle and throat 3. Time Permitting: Take photos of following PDGF areas, as daylight and worksite access permit: ❑ PDGF worksite closeout ❑ Cable routing ❑ PDGF mating surface clearance	CLEANUP (00:15) 1. Translate to PAMA/PDGF, nadir PMA route 2. Inspect cabling around FGB PDGF; ensure cables clear of mating interfaces and plane; use wire ties as reqd to secure cables in place 3. Wire tie any excess slack in any cabling 4. Retrieve grapple shaft cover/wire tie/RET from PDGF; stow in Med ORU bag 5. Retrieve gap spanner; stow in Med ORU bag 6. Perform bag inventory of Med ORU bag 7. Stow Med ORU bag on BRT w/RET
1. Perform Med ORU bag inventory: (Ref FS 7-110 for Final Inventories)	4. Translate to FGB zenith 5. Close Node 3 Cable bag, stow on BRT w/RET 6. Translate to A/L 7. Open hatch thermal cover 8. Stow bags in A/L: ❑ Med ORU bag ❑ Node 3 Cable bag ❑ C/L bag	8. Translate to A/L, nadir PMA route 9. Transfer Med ORU bag to EV1 for A/L stow 10. Retrieve Tool Stow C/L bag 11. Stow C/L bag on BRT w/RET
	(Stow EVA Camera - STP-H3 IR Imagery)	(Translate to P3, Bay 20 – HPGT FRGF MLI Install)

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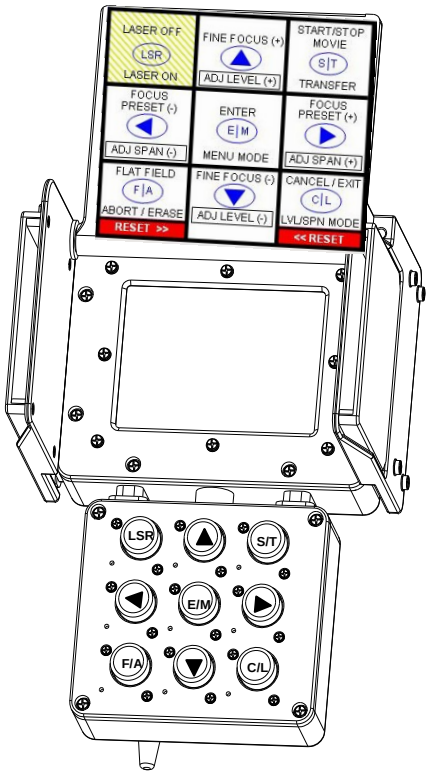
STP-H3 IR IMAGERY (00:40)

IV/SSRMS	EV1 (Drew)
Planned PET 05:20 1. Verify inhibits in place √PSARJ locked NOTE Press and release for top function. Press and hold ~3 sec for bottom function.  	CAUTION 1. Avoid inadvertent contact with MHTEX radiator – Z93 paint 2. Top of STP-H3 is a 1 ft KOZ NOTE IR Camera is set to auto stop a movie after 600 frames (10 mins). VADER IR PHOTOS (00:40) 1. Stow EVA camera in A/L 2. Retrieve IR camera from A/L √sw MASTER - ON, √LED - Off 3. Verify SAFER config ❑ √L handle down (MAN ISOL Vlv – Open) ❑ √R handle down (HCM – Closed) 4. Press and release ENABLE switch to initiate camera warmup (IV start 5 min timer) √LED - On 5. Stow IR camera on BRT w/RET 6. Close hatch thermal cover 7. Translate to P1 Bay 18 – zenith route 8. Attach **GREEN** hook to P1 HR 3681 ❑ √Gate closed, hook locked, reels unlocked, release RET 9. Translate to STP-H3 (outbd aft, zenith on ELC3) ❑ Stay 2’ away from TRRJ NOTE Do not put excessive force in BRT when fully extended 10. Remove IR camera from BRT and stow it on swing arm 11. Position body with body along ELC, head ISS aft and BRT to STP-H3 FRAM HR (EV2 assist as reqd) 12. Remove display from camera 13. Remove camera lens cover

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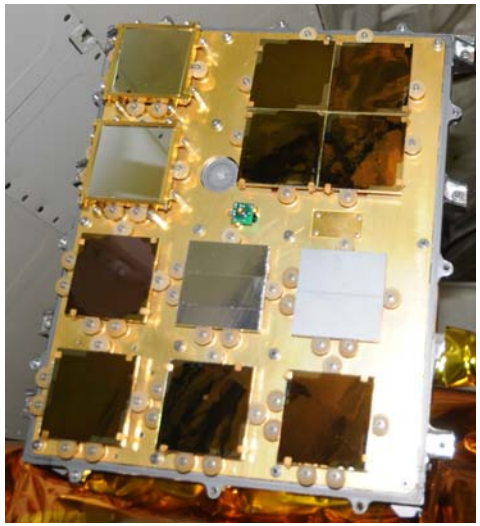
STP-H3 IR IMAGERY (00:40)

IV/SSRMS	EV1 (Drew)
MCC-H: *Switch VADER to low emissivity* 	14. Set camera focus on VADER zenith face using arrow keys (can be done during warm up): a. Right arrow Course Focus (+) b. Left arrow Course Focus (-) c. Up arrow Fine Focus (+) d. Down arrow Fine Focus (-) 15. After 5-min timer expires, perform Flat Field correction (Press and release F|A button) 16. Record 7 min video of VADER: a. Press and release the S|T button to start the video (frame countdown will start), notify **MCC-H** ❑ MCC-H will transition VADER to low emissivity during video b. After 7 mins or on **MCC-H Go**, press and release the S|T button to stop the video (frame countdown will stop) 17. Transfer movie to flash card (Press and hold S|T button for 3 sec. Expect 5-7 min to complete transfer) ❑ Transfer starts when '0% ready' displays. Transfer complete when message goes away 18. Press and hold ENABLE switch for 5 sec to shut down camera √LED - Off 19. Close lens cover 20. Stow display on the camera 21. Release BRT and relocate the IR camera to BRT w/RET 22. Translate to P1 HR 3681 23. Retrieve **GREEN** hook from P1 HR 3681 ❑ √Gate closed, hook locked, reels unlocked, release RET 24. Glove Check (Translate to A/L)

40

FS 7-139b

HPGT FRGF MLI INSTALL (00:40)

IV/SSRMS	EV2 (Spanky)
Planned PET 05:20 1. Verify inhibits in place √PSARJ locked	CAUTION Avoid inadvertent contact with SASA's hi-gain and lo-gain Antennas HPGT FRGF MLI INSTALL (00:30) 1. Translate to P3, Bay 20 – nadir route 2. Attach **GREEN** hook to CETA rail Xo 10230 ❑ √Gate closed, hook locked, reels unlocked, release RET 2a. Translate to STP-H3, assist EV1 with setup as required 3. Translate to HPGT (outbd, fwd on ELC3) 4. Retrieve MLI from C/L bag 5. Install MLI on HPGT FRGF (T at 1 o'clock) 6. Stow wire tie in trash bag or C/L bag 7. Glove Check 8. Retrieve **GREEN** hook from Xo 10230 ❑ √Gate closed, hook locked, reels unlocked, release RET (Translate to A/L)

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FS 7-147

EVA 3 CLEANUP/INGRESS (00:30)

IV/SSRMS	EV1 (Drew)	EV2 (Spanky)
Planned PET 06:00 1. Perform Tool and Bag Inventories: (Ref FS 7-__ for Final Inventories) 2. Start Hatch Thermal Cover clock PET (30 min) __ : __ 3. Prior to hatch closure, perform WVS PWRDN (PHOTO/TV, WVS Cue Card) 4. Stop Hatch Thermal Cover clock PET (30 min) __ : __	CLEANUP (00:15) 1. Translate to A/L 2. Perform MWS tool inventory INGRESS (00:15) 3. On **EV2 GO**, RET to EV2 STP, release **RED** hook and attach to aft ext D-ring ❑ √Gate closed, hook locked, reels unlocked, release RET 4. Attach R Waist Tether to A/L int D-ring ext ❑ √Gate closed, hook locked 5. RET to STP, release **RED** hook and attach to curved HR, fwd/stbd stanchion ❑ √Gate closed, hook locked, reels unlocked, release RET 6. Ingress A/L 7. Close thermal cover; attach Velcro strap 8. Remove SCU from stowage pouch 9. Remove DCM cover; Velcro to DCM 10. Connect SCU to DCM; √SCU locked NOTE A TCV setting 8 – Max C minimizes time for SCU cooling 11. WATER – OFF (fwd), expect H2O IS OFF msg CAUTION Do not close hatch until EMU Water OFF for 2 min. Verify outer hatch clear of hardware 12. Verify outer hatch clear of hardware 13. Verify handle position per hatch decal 14. Close and lock hatch Go to PRE-REPRESS (DEPRESS/REPRESS Cue Card)	CLEANUP (00:15) 1. Translate to A/L ❑ Fairlead on Equip Lock HR 0500 2. Perform MWS tool inventory INGRESS (00:15) 3. Open hatch thermal cover 4. Stow Tool Stow C/L bag and IR camera in A/L 5. Attach R Waist Tether to UIA D-ring ❑ √Gate closed, hook locked 6. Ingress A/L 7. Give **EV1 GO** to release EV2 **RED** hook 8. Remove SCU from stowage pouch 9. Remove DCM cover; Velcro to DCM 10. Connect SCU to DCM; √SCU locked NOTE A TCV setting 8 – Max C minimizes time for SCU cooling 11. WATER – OFF (fwd), expect H2O IS OFF msg Go to PRE-REPRESS (DEPRESS/REPRESS Cue Card)

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FS 7-149

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GET AHEAD: A/L TOOLBOX TOOL STOW (00:40)

IV/SSRMS	EV2 (Spanky)
~~Planned PET 04:50~~	A/L TOOLBOX TOOL STOW (00:35) 1. Translate to A/L, watch for EV1 ST 2. Open hatch thermal cover 3. Retrieve Tool Stow C/L bag 4. Close hatch thermal cover 5. Translate to A/L Toolboxes NOTE Tether to all toolboards prior to removal 6. Stow C/L bag on stbd/nadir door 7. Retrieve and temp stow fish stringer 8. Stow following tools in the Port A/L Toolbox (figs 1-2): ❑ Behind Zenith Door – Slot 1 (fig 3) ❑ Pin Straightener ❑ Behind Nadir Door – Slot 5 (figs 4-7) ❑ Short MMOD T-handle tool (tether point aligned with angled slot) ❑ Short MMOD T-handle tool (tether point aligned with angled slot) 9. From Panel 8 (inside nadir door), retrieve the GP/Large Cutters; stow on fish stringer (fig 2) 10. Close both doors; ❑ Verify at least one lever in lock position 11. Stow following tools in Starboard A/L Toolbox (fig 8): ❑ Inside Zenith Door – Panel 9 (fig 9) ❑ Probe ❑ Behind Zenith Door – Slot 5 (fig 10) ❑ Vise Grips 12. Close door; ❑ Verify at least one lever in lock position 1" CAP TOOL STOW (00:05) 13. Retreive 1" QD cap tool from fish stringer 14. Translate zenith to stbd Fluid QD bag 15. Open stbd Fluid QD bag (stbd/aft corner or upper/left corner) 16. Stow 1" QD cap tool in FQD bag 17. Close Fluid QD bag (√Velcro secure) 18. Stow fish stringer in C/L bag (pull HPGT MLI out and stow on top of fish stringer)
1. Perform C/L bag inventory: (Ref FS 7-111 for Final Inventories)	19. Perform bag inventory of C/L bag 20. Stow Tool Stow C/L bag on BRT w/RET ~~(Translate to ELC3 – HPGT MLI Install)~~

FS 7-140

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STP-H3 IR IMAGERY - TASK DATA

Estimated Task Duration:

	With RMS	Without RMS
One EV Crew	N/A	00:30
Two EV Crew	N/A	00:30

Tools:

EV1
EVA IR Camera

Foot Restraints:

Task	WIF	APFR Setting
Contingency for VADER IR Imagery	ELC3 WIF 3	[6,SS,F,12]

APFR Note:
If using the APFR on ELC3, there is the following constraint: While the second EVA crewmember is translating on the ELC3 structure, the first EVA crewmember in the APFR must maintain a handhold on approved ELC3 structure. This is to protect APFR hardware loads from exceeding the trip limit (ref EID684-14188).

Notes:
1. IR Camera is set to auto stop a movie after 600 frames (10 mins).
2. Do not put excessive force in BRT when fully extended

Cautions:
1. Avoid inadvertent contact with MHTEX radiator – Z93 paint
2. Top of STP-H3 is a 1 ft KOZ

Timeline Considerations:
1. EVA IR Camera must be in standby mode starting at Egress
2. EVA IR Camera needs 5 min to warm-up before use

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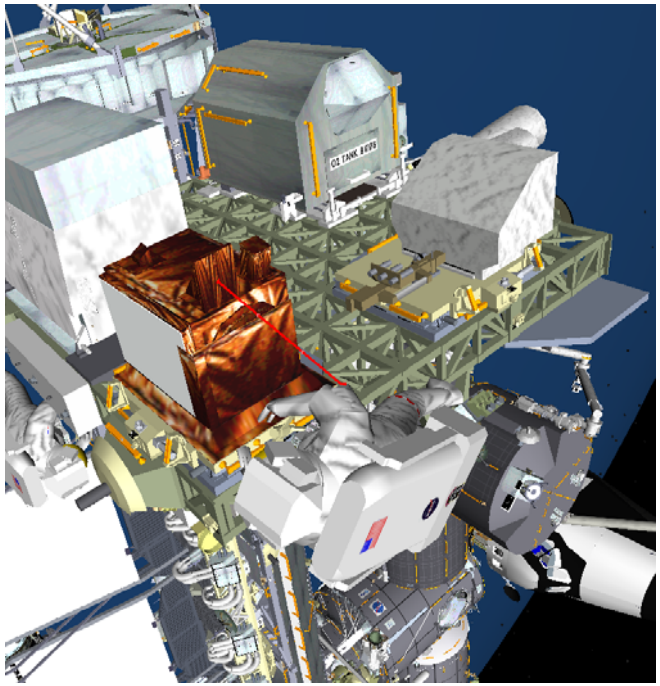
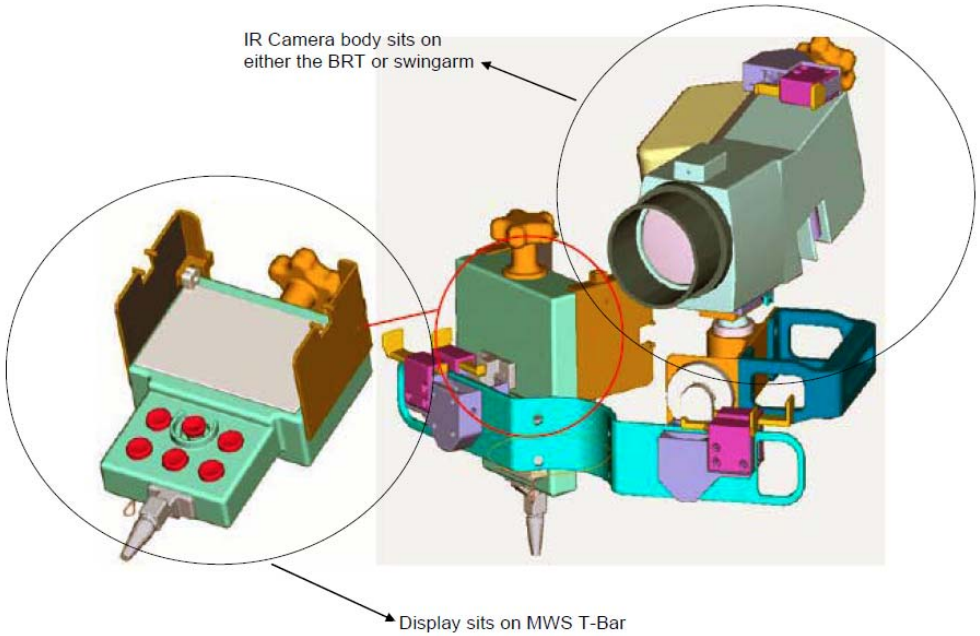
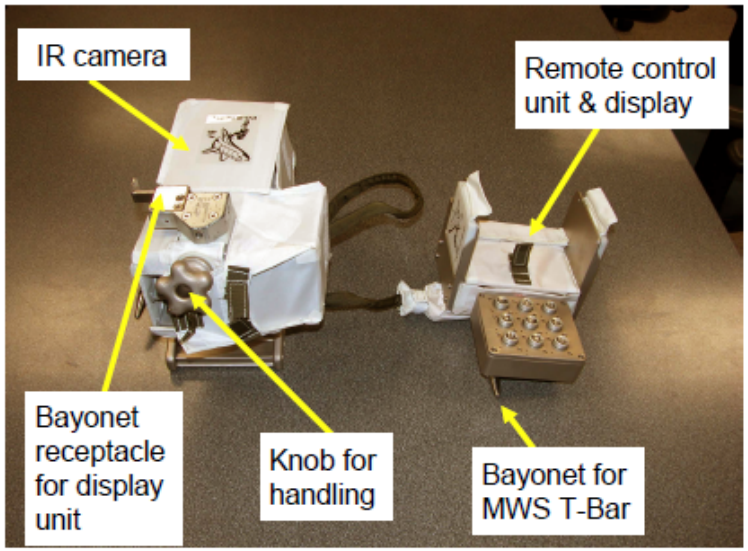
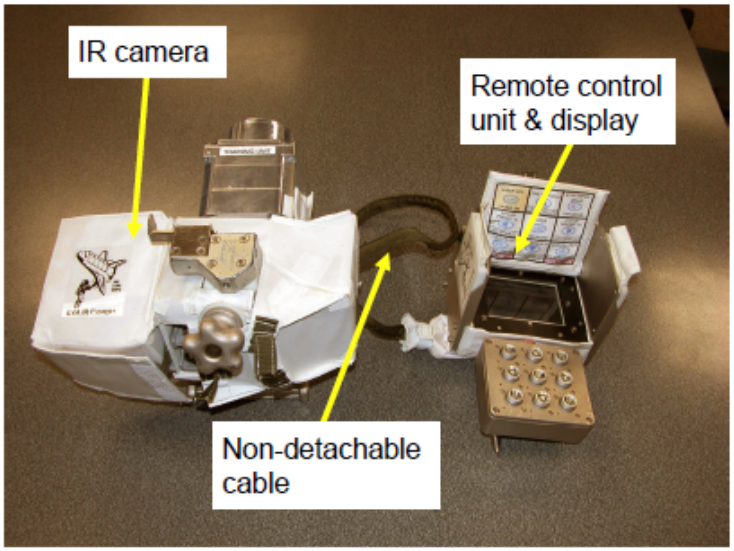


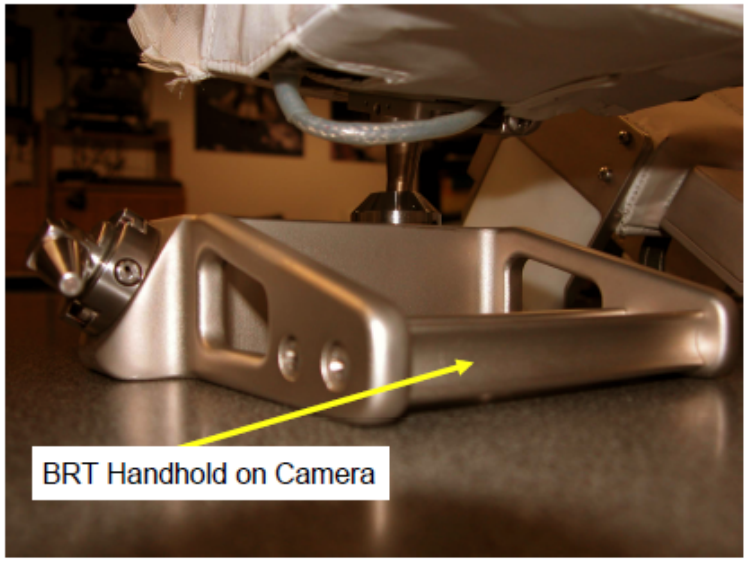


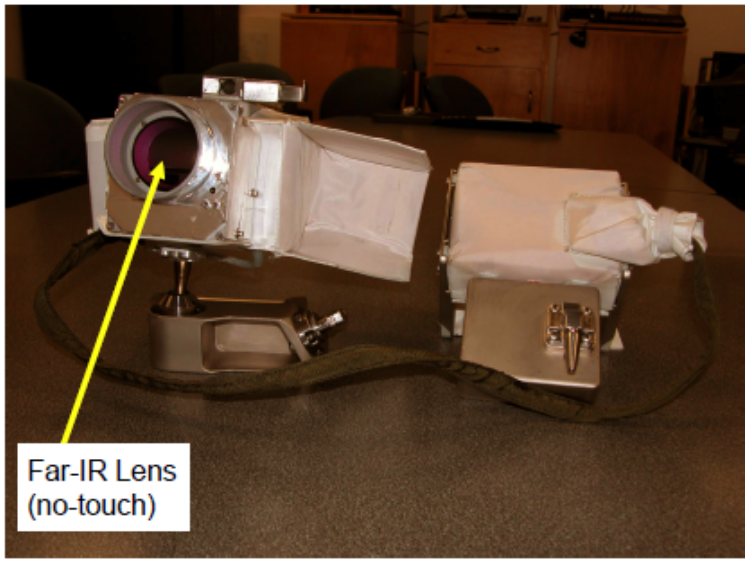
FS 7-170a

STP-H3 IR IMAGERY - TASK DATA









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FS 7-170b

DURATION: 2 hours

INSTRUCTIONS:
Gather 'Warning PCNs' Ziplock from the half CTB located on LAB1P6 rack front.

> NOTE
> Green rings on PCNs were for ease during shipment.
> Stow rings per crew preference.

Warning PCN Incorporation
In the **LAB:**

Retrieve Warning Procedures Book (Cover Date: 15 FEB 2011) _____
Gather Warning PCN [Qty:1] from 'Warning PCNs' Ziplock
- ❑ Replace cover
- ❑ Replace pages 675 thru 680
- ❑ Replace pages 717 thru 770
- ❑ Replace pages 803 thru 832; add 832a and 832b
- ❑ Replace pages 907 thru 938
- ❑ Replace pages 945 thru 972; add 972a and 972b
- ❑ Replace pages 1037 and 1038

Place discarded cover and pages in the ISS common trash
Stow Warning Procedures Book (New Cover Date: 25 MAR 2011) _____

In the **SM:**

Retrieve Warning Procedures Book (Cover Date: 15 FEB 2011) _____
Gather Warning PCN [Qty:1] from 'Warning PCNs' Ziplock
- ❑ Replace cover
- ❑ Replace pages 675 thru 680
- ❑ Replace pages 717 thru 770
- ❑ Replace pages 803 thru 832; add 832a and 832b
- ❑ Replace pages 907 thru 938
- ❑ Replace pages 945 thru 972; add 972a and 972b
- ❑ Replace pages 1037 and 1038

Place discarded cover and pages in the ISS common trash
Stow Warning Procedures Book (New Cover Date: 25 MAR 2011) _____

In the **FGB:**

Retrieve Warning Procedures Book (Cover Date: 15 FEB 2011) _____
Gather Warning PCN [Qty:1] from 'Warning PCNs' Ziplock
- ❑ Replace cover
- ❑ Replace pages 675 thru 680
- ❑ Replace pages 717 thru 770
- ❑ Replace pages 803 thru 832; add 832a and 832b
- ❑ Replace pages 907 thru 938
- ❑ Replace pages 945 thru 972; add 972a and 972b
- ❑ Replace pages 1037 and 1038

Place discarded cover and pages in the ISS common trash
Stow Warning Procedures Book (New Cover Date: 25 MAR 2011) _____

Ammonia Detection Kit Updates
Gather Ammonia Detection Kit Cue Card #1 [QTY:2] and procedure 2.836 IFHX NH3 LEAK DETECTED – WARN [QTY:2] from 'Warning PCNs' Ziplock

In the **FGB**:

Kit # 1, behind FGB panel 308

- ❑ Replace 1 copy each of Ammonia Detection Kit Cue Card #1 and procedure 2.836 IFHX NH3 LEAK DETECTED – WARN _____

In the **MRM2**:

Kit # 2, visible crew preference location

- ❑ Replace 1 copy each of Ammonia Detection Kit Cue Card #1 and procedure 2.836 IFHX NH3 LEAK DETECTED – WARN _____

Place discarded cue cards and pages in the ISS common trash

Report completion to MCC-H.

OBJECTIVE:
Adjust Body Restraint Tether (BRT) ball stack stiffness.

DURATION:
30 minutes to adjust cable tension and re-install screws.

MATERIALS:
Ziploc Bag
Kapton Tape (if required per step 1.11)

TOOLS:
ISS IVA Toolbox:
Drawer 2:
Ratchet, 1/4" Drive
1/4” to 3/8” Adapter
(5-35 in-lbs) Torq Driver, 1/4" Drive
Drawer 3:
4-1/32" Long, #2 Phillips, 3/8" Drive

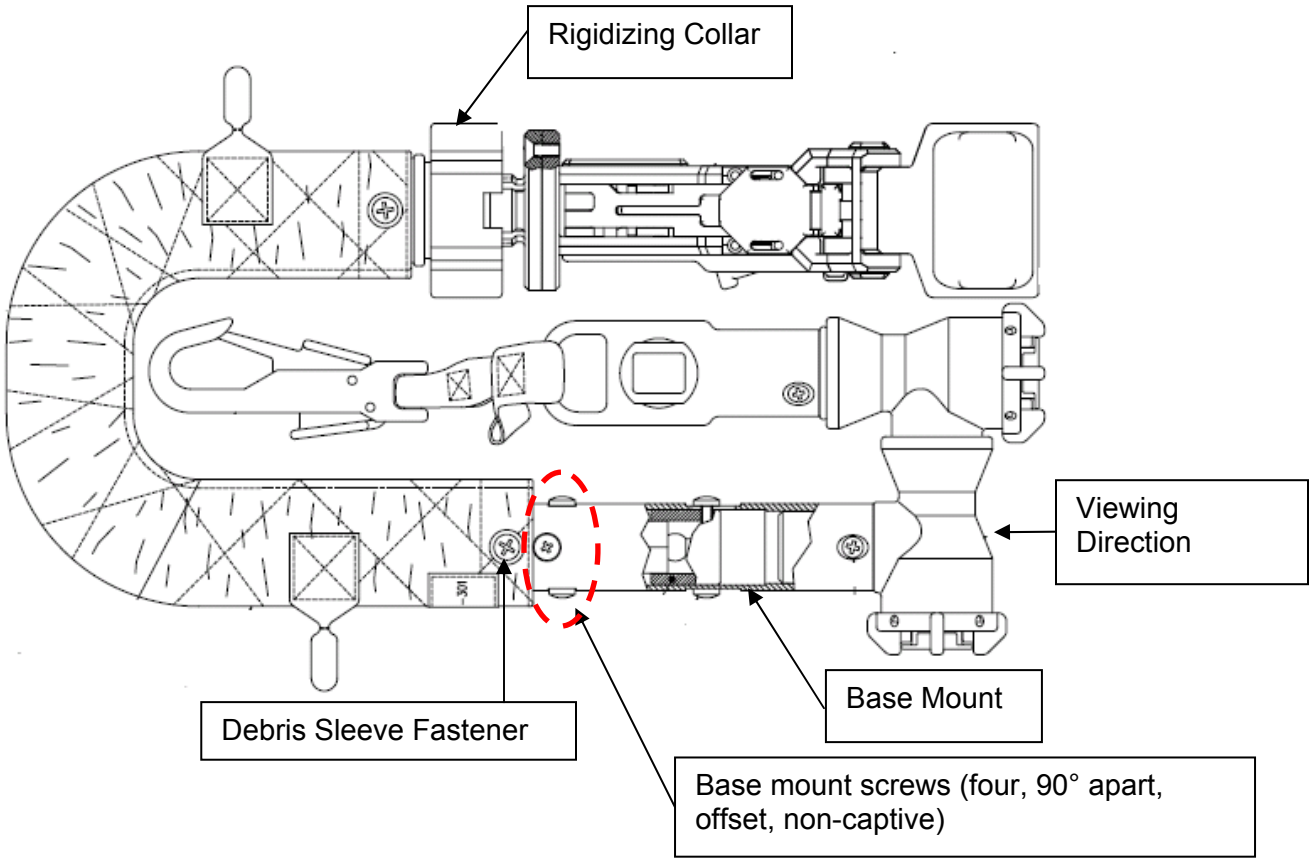


Figure 1. – Location of BRT Fasteners.
(Configuration Shown for Reference Only)

1. BALL STACK STIFFNESS ADJUSTMENT

WARNING

A locking feature in the base mount screws will result in a high breaking torque (up to 40 in-lbs) during removal. This may result in tool slippage and personal injury.

NOTE

Removal of 4 screws will allow separation of base mount assembly from ball stack. If separation occurs, reassemble.

1.1 Call down Serial Number of BRT being adjusted. (Serial Number is located on Debris Sleeve)

1.2 Remove non-captive base mount screws (four) (Ratchet, ¼" Drive; 1/4" to 3/8" Adapter; #2 Phillips, 3/8" Drive).
Refer to Figure 2.
Stow non-captive screws (Ziploc Bag).

Figure 2. - Release Base Mount Screws.

1.3 Extend BRT to maximum length and ensure rigidizing collar is fully rigidized (tightened).

1.4 While grasping ball stack in area of debris sleeve fasteners (Refer to Figure 3), maintain slight inward force and rotate base mount assembly 180° counter-clockwise relative to ball stack (Ref Figure 1 and 3, viewing direction) until screw holes are aligned. (Total number of CCW turns is recorded below in step 1.7.)

NOTE
If base mount assembly cannot be rotated by hand, no other adjustment method is available, and should not be attempted. Proceed to 1.9.

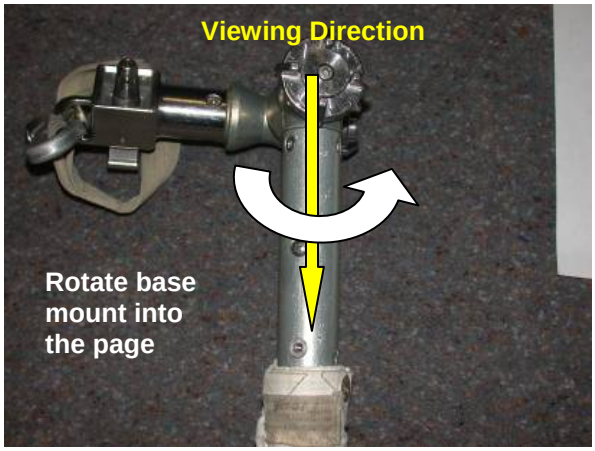


Figure 3. - Rotate Base Mount Assembly Counter Clockwise 180° CCW.

1.5 Check ball stack for desired stiffness.

1.6 Repeat step 1.4 until desired stiffness is achieved.
If desired stiffness cannot be obtained, proceed to 1.9.

1.7 Loosen rigidizing collar and verify that minimum stiffness is acceptable.
Record total number of CCW turns of base mount assembly: _____

1.8 If too stiff, rotate base mount assembly clockwise and test until stiffnesses are balanced (user preference).
Record number of CW turns of base mount assembly, if required: _____
(Step is reverse process of 1.4 to 1.5.)

NOTE
The locking feature in the base mount should prevent full insertion of the non-captive screws.

1.9 Align holes in ball stack and base mount and re-install base mount screws (four) finger tight.
Refer to Figure 4.
If any screw can be completely installed just by finger tightening, report to **MCC-H** that locking feature is non-functional.

Figure 4. - Initial Screw Installation, Finger Tight.

1.10 In either case, complete installation of screws. Tighten, torque to 35 in-lbs.(Ratchet, 1/4” Drive; (5-35 in-lbs) Torq Driver, ¼” Drive; 1/4” to 3/8”Adapter; #2 Phillips, 3/8" Drive).

1.11 Inspect screw heads for sharp edges. If found, wrap with 2 layers of Kapton tape.
Refer to Figure 5.

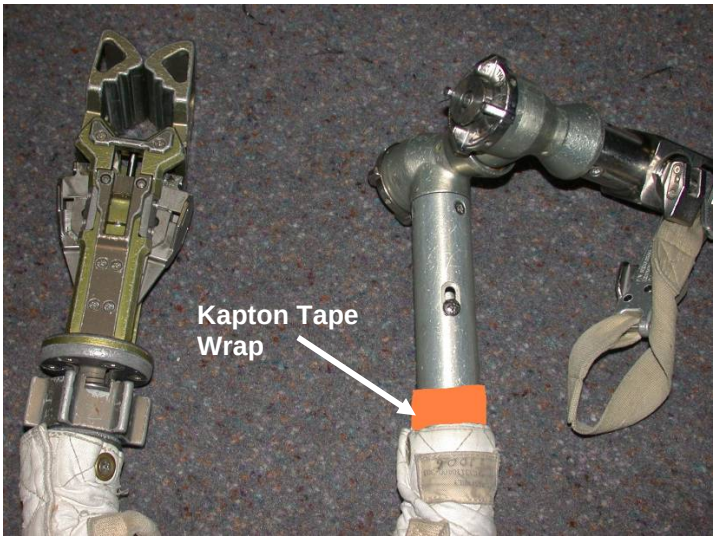


Figure 5. - Kapton Tape Installation.

1.12 Verify that seam in debris sleeve is straight.
Refer to Figure 6.

Figure 6. - Seam Alignment.

1.13 Perform functional stiffness test with assembled BRT at maximum length. Extend BRT to maximum length and fully rigidize collar (tightened). Check ballstack for proper operation**.**

1.14 Report completion to **MCC-H**.

MSG 093: STORRM CABLE TROUBLESHOOTING

1.0 HARDWARE CONNECTION

PGSC

1.1 √All four legs of STORRM RS-422 DATA cable connected to PCMCIA card dongles

1.2 If cable(s) loose/disconnected
Reconnect cable(s)

1.3 √Both PCMCIA cards firmly seated
If one or both PCMCIA cards loose/disconnected
Reseat PCMCIA card(s)

1.4 √RJ-45 Ethernet cable
If cable is loose/disconnected
Reconnect cable

STORRM AP

1.5 √All four LAN connectors. Gently pull to determine quality of connection then reconnect each of the four cables verifying engagement of connector.

The ports and cables should be matched up as follows:
LAN1= DRU1
LAN2= DRU3
LAN3= STORRM PGSC
LAN4 = PGSC WAP

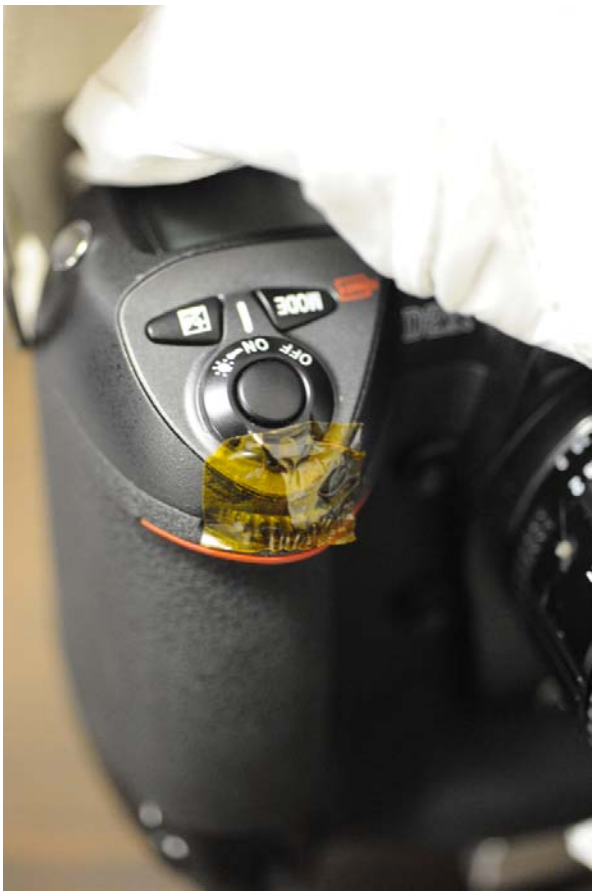
1.6 Notify **MCC-H**, number and name of any off-nominal connection.

END OF PAGE 1 OF 1, MSG 093

Preventing Manipulation of EVA CAMERA Power Switch

Background: During EVA 2 it was reported that one camera would not work. After the EVA it was found that the power switch had been turned to the OFF position after egress.

Workaround: In order to ensure that the EVA Camera ON/OFF switch cannot be manipulated after the EVA Camera Blanket is installed, an additional step is being added to the execution note of the ISS activity P/TV EVA CAMR TRNARD to tape the ON/OFF switch with Kapton tape.



MSG 095 - EVA 3 IR CAMERA FOR VADER IMAGRY

OBJECTIVE:
Assembly of the EVA IR Camera and thermal data collection of the VADER payload.

Table 1. Parts

Nomenclature	Part No.
EVA IR Camera	1257950-701
EHIP Battery Pack	SEG39130223-303
Compact Flash Card	SDCFBI-1024-201-00
Compact Flash to PCMCIA Adaptor	SDZ12100650-301

1. LOCATING THE EVA IR CAMERA AND THE EHIP BATTERY
   1.1 Locate the EVA IR Camera at NOD104_A2 (in 0.5 CTB, barcode 006590J, s/n 1141).

   1.2 Obtain the EHIP Battery Pack, s/n 1029 from EVA #3 Systems mesh bag.

2. CONFIGURING EVA IR CAMERA FOR OPERATIONS
   2.1 Install EHIP Battery Pack.

   2.2 √Compact Flash Card installed

   2.3 Close right side thermal cover.

   2.4 Lens Cover – Fold to left side

   2.5 sw MASTER → ON (Wait 30 seconds for initialization.)
   If **'Level/Span: Manual'** or **'Manual'** displayed in top left of LCD:
   - 2.6 pb E/M → Press, hold (to activate menu)
   - 2.7 sel **'Image'** – **'Continuous adjust'** [pb E/M → Press (to select)]
   - 2.8 √**'Level/Span: Manual'** or **'Manual'** not displayed in top left of LCD

   2.9 √Date/Time set to GMT (lower left of LCD)
   If Date/Time incorrect:
   - 2.10 pb E/M → Press, hold (to activate menu)
   - 2.11 sel **'Setup'** – **'Other settings'** [pb E/M → Press (to select)]
   - 2.12 sel **'Date/time'** [pb E/M → Press (to select)]
   - 2.13 sel desired field [pb Up/Down Arrow → Press (to set GMT)]

   ~

2.14 sel desired settings [pb Left/Right Arrow → Press (to set GMT)]

2.15 pb E/M → Press

2.16 Set Burst and Frame Rate

2.16.1 pb E/M → Press, hold (to activate menu)

2.16.2 sel '**File**' – '**Burst Setup**' [pb E/M → Press (to select)]

2.16.3 '**Max #Frames**' – '**600**' [pb Left/Right Arrow → Press (to select)]

2.16.4 '**Save every**' – '**60**', '**Frame**' [pb Left/Right Arrow (to select)]

NOTE
'**FPS**' and '**Elapse Time**' determined by '**Max #Frames**' and '**Save Every**' settings.

2.16.5 √'**FPS**' – '**1.0**'

2.16.6 √'**Elapse Time**' – '**600**'

2.16.7 pb E/M → Press

2.17 Clear Compact Flash Card

2.17.1 pb E/M → Press, hold (to activate menu)

2.17.2 sel '**File**' – '**Images…**' [pb E/M → Press to select)]

2.17.3 pb E/M → Press, hold (to activate menu)

2.17.4 sel '**Delete all images**' [pb E/M → Press (to select)]

2.17.5 sel '**Delete**' (Press E/M to select)

2.17.6 √'**No image saved**'

2.17.7 pb C/L → Press

2.18 Camera Powerdown

2.18.1 sw ENABLE → Up (hold for 5 seconds)

2.18.2 Lens Cover – Reinstall

2.18.3 sw MASTER → Off

The Camera is now ready for the EVA timeline.

3. IMAGE DOWNLINK

3.1 √sw MASTER – Off

3.2 Remove Compact Flash Card from the EVA IR Camera.

3.3 On any networked ISS SSC, copy files to C:\Images for downlink.

3.4 Notify MCC-H which ISS SSC the IR imagery was transferred to.

3.5 When transfer to ISS SSC complete, install the Compact Flash Card back into the EVA IR Camera.

4. DEACTIVATION

EVA IR Camera

4.1 √Lens Cover – Installed

4.2 Remove EHIP Battery Pack.

4.3 Stow EHIP Battery Pack in A/L1O1 in M02 bag s/n 1038.

4.4 Stow EVA IR Camera in the 0.5 CTB barcode 006590J, s/n 1141.

4.5 Stow the 0.5 CTB in NOD1O4_A2.

BATT-INSTL (MS1, MS3) - 144/03:16

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**NOD1_Deployed** Mesh Bag: EVA 3 Systems	LiOH Cartridge Canister [Qty: 2]	MC621-0008-0409/SV755510-4	Any	Any	REPORT S/Ns to MCC-H
2		EMU Li-Ion Battery	SV1014881-00-00	3004 3005	00133625J 00133626J	
3	**EMU 3004** Aft EDDA	LiOH Cartridge Canister	MC621-0008-0409/SV755510-4	2016		used during EVA 2
4	**EMU 3018** Fwd EDDA	LiOH Cartridge Canister	MC621-0008-0409/SV755510-4	2030		used during EVA 2
Type: Restow						
5	**EMU 3004** Aft EDDA	LiOH Cartridge Canister	MC621-0008-0409/SV755510-4	Any		Report s/n to MCC-H
6		EMU Li-Ion Battery	SV1014881-00-00	3004	00133625J	
7	**EMU 3018** Fwd EDDA	LiOH Cartridge Canister	MC621-0008-0409/SV755510-4	Any		Report S/N to MCC-H
8		EMU Li-Ion Battery	SV1014881-00-00	3005	00133626J	
9	**SYSTEMS TRANSFER Bag**	LiOH Cartridge Canister	MC621-0008-0409/SV755510-4	2016		
10		LiOH Cartridge Canister	MC621-0008-0409/SV755510-4	2030		

CDRA-REAR-UTILITIES (CDR,FE-3) - 144/03:41

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**Crew Preference**	Kapton Tape				
2		Dry Wipes				
3		Gray Tape				
4		Ziplock Bag				
5		Velcro Strap				
6	**NOD1D4_G2 Drawer 2** Drawer 2, S/N 1003	Ratchet, 1/4" Drive	SKG33117562-939			
7		5/32" Hex Head, 1/4" Drive	SKG33117562-742			
8	**NOD1D4_G2 Drawer 5** Drawer 5, S/N 1003	Static Wrist Tether	SKG33117562-335			

MERLIN-DESCANT-RMV (MS4) - 144/05:06

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**Crew Preference**	Gray Tape, 1”				
2		Dry Wipes				
3	**NOD2O1** 1.0 CTB Ziplock Pantry, S/N 1104, B/C 004098J	12x12 Ziplock Bag				
Type: Restow						
4	**JPM1F5_J1** 0.5 CTB, S/N 1216, B/C 010397J	MERLIN Pouch Assembly	CBSE-F10077-1	001	MRLN0063M	Inside 0.5 CTB S/N 1216 - Used only to restow items.
5		12x12 Ziplock Bag (Labeled ‘Used’)				
6		Desiccant Pack [QTY: 2]				Report B/C or S/N to POIC.
7		Arctic Payload Tray	WLSI242108-301		ARCTPT02J	

OGS-QD-MATE (MS1) - 144/07:16

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**NOD1D4_K2** FFTD & Gamah Seal Maintenance Kit, S/N 1001	Brass Pick				Only required if contaminants found in Oxygen QDs
2	**Crew Pref**	Ziplock Bags				
3		Velcro Ties				
4		Scissors				
5	**NOD1O4_C1** 0.5 CTB: Rubber Gloves, S/N 1159, B/C 006608J	Clean Room Gloves	SEG33116979-301			
Type: Restow						
6	**PMM1S3_B1** 0.5 CTB: OGS Hardware, S/N 1349, B/C 010530J	Ziplock of H2 Sensor ORU Caps	OGS Caps			
7		1/2" QD Caps [QTY:2]	SV825483-5			

GREASE GUN CLEANUP (MS3) - 144/07:46

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**A/L1 Deployed**	Straight Nozzle Grease Gun Assy	SED33120736-305	1004 1007		Used during EVA 2
2		J-hook Nozzle Grease Gun Assy	SEG33120736-306	1002 1005		used during EVA 2
3	**NOD2O1** Ziplock Pantry	Large Ziploc (24" x 24")	Ziploc			Qty Four
Type: Restow						
4	**A/L1 Deployed** "Done Tools" Mesh Bag	Straight Nozzle Grease Gun Assy	SED33120736-305	1004 1007		each gun in individual bag
5		J-hook Nozzle Grease Gun Assy	SEG33120736-306	1002 1005		each gun in individual bag

OGS-RACK-ACCESS (MS4) - 144/07:56

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**A/L1_Deployed**	CSA-O2 [Qty. 2]	SED46115801-305	1045 1046	00127914J 00054324J	
2	**NOD1D4_G2** **Drawer 2**	Ratchet, 1/4" Drive	SKG33117562-939			
3		5/32" Hex Head, 1/4" Drive	SKG33117562-742			

OGS-CONT-INSTALL (MS1, MS4) - 144/08:41

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**Temp stowed from OGS-QD-MOD on GMT 141**	OGA Filter to HX Jumper Assy	SEG33123138-301			Jumper with modified QD
2		1/4" QD	502060-1191			Removed from OGA Filter to HX Jumper
3	**PMM1S3_C1** 1.0 CTB, S/N 1291, B/C 010627J	OGA Pump to ACTEX Jumper	SV825600CT014	01	00142435J	
4		Silver Removal Cartridge	SEG11100313-311	2002	00140412J	
5		OGA Remediation Adapter	SEG33122706-302	1001	00146236J	Mated to Silver Removal Cartridge for thermal compliance.
6		30cc Syringe	SEG46121619-301			Labeled "THERMAL". Mated to Silver Removal Cartridge for thermal compliance.
7	**JPM1F6_A1** 0.5 CTB, S/N 1021, B/C 002861J, "LAB-A/L ISL H/W"	Large Ziplock				
8		8" Wire Tie	T30M2HALC2			If required to secure remediation hardware inside OGS rack per step 6.
9	**ISS IVA Toolbox**	Ratchet, 1/4" Drive	SKG33117562-939			
10		5/32" Hex Head, 1/4" Drive	SKG33117562-742			
Type: Restow						
11	**PMM1S3_C1** 1.0 CTB, S/N 1291, B/C 010627J	30cc Syringe	SEG46121619-301			Labeled "THERMAL." Removed from Silver Removal Cartridge.
12		OGA Remediation Adapter	SEG33122706-302	1001	00146236J	
13		1/4" QD	502060-1191	1001	00146236J	Mated to OGA Remediation Adapter to provide thermal compliance during stowage.

Node 3 CDRA Bed 201 R&R Big Picture Words

BACKGROUND:

The main objective for the CDRA maintenance on ULF6 is to remove the Node 3 CDRA Bed 201 and stow it for return to Earth on the shuttle. Bed 201 is commonly referred to as "the back bed". A replacement bed flew on ULF-6, and will be installed in the bed 201 location, but removing the currently installed bed for return is the main objective.

PROCEDURES:

27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) - *Hardcopy on Shuttle* - Book: ISS CDRA stowed at MF71G
25-0311 CDRA Desiccant/Sorbent Bed 201 R&R NOD3A4 - Appendix - *Hardcopy on Shuttle* - Book: ISS CDRA stowed at MF71G
25-0315 Node 3 (AR2) CDRA Stowage Configuration

27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) was written with the understanding that it would be executed in three parts during the ULF-5 mission. However, the task may be divided into more parts, so please focus on the steps called out in execute notes rather than relying on the procedure to tell you when to start and stop an activity.

ACTIVITY OVERVIEW:

Activity Description: Kabin Removal
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) step 1
Details: Kabin Removal is listed in the procedure as an "if required" step. During ULF5, the crew was able to rotate the AR Rack down partially to manipulate the CDRA rear connections, without removing the Kabin. They also verified that it is possible to remove the CDRA frame from the front of the AR rack without removing Kabin. So, we do not believe that you will have to remove the Kabin, but left the step in incase you needed more access. If you do happen to remove the Kabin, a step to replace it when you are complete is at the end of the procedure (step 27).

Activity Description: CDRA Frame Prep for Removal
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) steps 2-6
Details: Disconnect the CDRA main power/data and fluid utilities. This activity requires rack rotation. Before rotating the AR rack, the Vacuum line must be demated. If not demated, the umbilical may incur damage due to the rotation. This demate is incorporated in your procedure. After rotating the rack down, you will remove the rack rear access panel and demate several power/data connections, Fluid QDs and hydraflow couplings.

A few things to remember about Hydraflow fittings:
Hold the male side steady and turn the female side. The two o-rings making a good seal in the connection are under the male side of the fitting. This makes it very hard to turn the male fitting and you risk damage to the o-rings. (We do have spares on board, if required). The fittings are meant to be hand-tight and should not require tools. For a better grip, we recommend deerskin gloves or an exercise band. Tools may deform the hydraflow couplings and make it increasingly harder to mate/demate the connections.

As you demate connections, you will place a ziplock back and secure with Kapton tape over the open fittings to prevent FOD introduction in to the system. For the power/data and hydraflow connections, kapton tape alone is acceptable.

Activity Description: CDRA Frame Removal
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) steps 8-10
Details: There are two bolts used as a grounding path for the CDRA that are securing the frame in place. To remove these bolts, you will partially rotate the rack and remove the side access panel. Once the bolts are removed, the rack is rotated up and CDRA is removed through the front right access door of the AR rack. You may use the Wireway/Coldplate Covers (AKA cookie sheets) to help you in sliding the CDRA out. There are two star blocks in step 9 that have additional access steps if you need them. One is to remove a grounding wire from the rack faceplate and the other is to remove some insulation from a selector valve that may or may not cause interference with the rack structure. Also, the seat track buttons on the CDRA Bed are only 8” apart and do not accommodate the installation of an 8.5” Handrail. However, if you need a translation aid, you can install one side of the handrail and use it that way. Other crews have also installed Seat Track Stud Rings on each of the buttons and used those to help pull the CDRA out. Either way, an aid has been helpful to crews in the past, as it does require a good amount of force to pull the CDRA frame out.

Activity Description: CDRA Tie-Down in JPM
Procedure: 25-0315 Node 3 (AR2) CDRA Stowage Configuration
Details: Procedure contains specific steps to tie down the CDRA frame for stowage in the JPM. This will also be where you perform the work to remove the CDRA Bed 201 for return.

Activity Description: CDRA Component Group Removal
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) steps 11-14
Details: To access the CDRA Bed 201 for removal, you must first remove all the components from the CDRA frame (ducting, blower/precooler, Selector Valves, etc). These components come off in 3 groups. They have been color coded in the procedure and appendix to help with the removal. It is important to keep the component groups together, as they will go back on as groups too. During the removal of the component groups, you will encounter several conical filters (AKA sock filters). The following note is in the procedure:

NOTE
Sock Filters have been installed to prevent Zeolite Debris from damaging CDRA pump and Selector Valves. Filters are delicate cone screens fitted inside the Hydraflow coupling. There are six total Filters, four will be exposed during this maintenance procedure and 1 will NOT be re-installed once removed.
1. CDRA Bed 201 Filter (1.5" diameter, 8" long) - Leave out
2. CDRA Pump Filter (0.5" diameter, 1.5" long) - Re-install
3. CDRA Valve 104 Filter (0.5" diameter, 1.5" long) - Re-install
4. CDRA Valve 103 Filter (1.5" diameter, 3" long) - Re-install

During the development of the ULF6 timeline, it was determined that TWO of these filters should not be re-installed. Per the execute notes for this activity, you will NOT re-install:

1. CDRA Bed 201 Filter (1.5" diameter, 8" long) - Leave out

4. CDRA Valve 103 Filter (1.5" diameter, 3" long) - ~~Re-install~~ LEAVE OUT

This basically means, leave out all 1.5” diameter filters. The procedure has you create a ziplock bag for the filters that will not be reinstalled. Your stowage note will tell you where to restow these. The other two filters should be treated as part of their respective component groups and stowed for later re-installation.

Activity Description: CDRA Bed 201 R&R
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) steps 15-16
Details: The CDRA Desiccant/Sorbent Bed 201 has two electrical/data connections, four bolts and four pin assemblies. The pin assemblies are at the top of the CDRA Bed and serve as alignment guides for installation. Each pin assembly has 3 fasteners. These pin assembly fasteners have been known to become non-captive. Also, the CDRA Bed is covered in insulation. This insulation is plyable and can be pushed or deformed in order to remove or replace the CDRA Bed.

Activity Description: CDRA Component Group Replace
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) steps 17-21
Details: Component groups will be replaced in the reverse order in which they were removed. So, you will start replacement with Component Group 3. As listed in the details above about CDRA Filters, you will only be replacing the 0.5” diameter filters (Qty 2) during the component group replacement. This is a change from what is written in the procedure. This will also be outlined in the execute notes for this activity. Step 18 was written specifically on how to install the CDRA Valve 103 Filter. You will now only use that step to replace the ducting instead of the ducting and filter.

Activity Description: CDRA Frame Replacement
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) step 22
Details: You will be installing the CDRA Frame in to the rack through the front access panel. Some crews have found that partially through the installation, they need to rotate the rack down to verify no cables or fluid lines are being caught. This is perfectly fine, but may require a Kabin Removal. Also, the last few inches have been known to be a little sticky. Once you’ve verified that no cables or fluid lines are preventing installation, the last few inches may require a more substantial “shove” than you might expect.

Activity Description: Mating CDRA Utilities
Procedure: 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) steps 23-26
Details: Most CDRA Utilities are located at the back of the rack. For this activity, you will be rotating down and mating those utilities. You will start with the power/data utilities. Once those are mated, you will pause while the ground verifies that the CDRA responds to commanding. Then, when you get the thumbs up, you’ll proceed on to remate all the fluid QDs and hydraflow fittings. Once that is complete, you will close out the rear of the rack and rotate up. At this point, you’ll remate a few connections at the rack UIP and then report to MCC that the CDRA is ready for activation!

MSG 098 – FD9 Crew Choice Downlink Opportunities

Post-Sleep Morning of FD9

TDRS	AOS	LOS	Delta (min)	Notes
E-TDS	7/11:02	7/11:32	30	Time actually prior to W/U. Alpha stop at 11:19
W-171	7/11:52	7/12:14	22	
E-TDS	7/12:42	7/13:00	18	
W-171	7/13:27	7/14:00	33	
E-TDS	7/14:08	7/14:38	30	

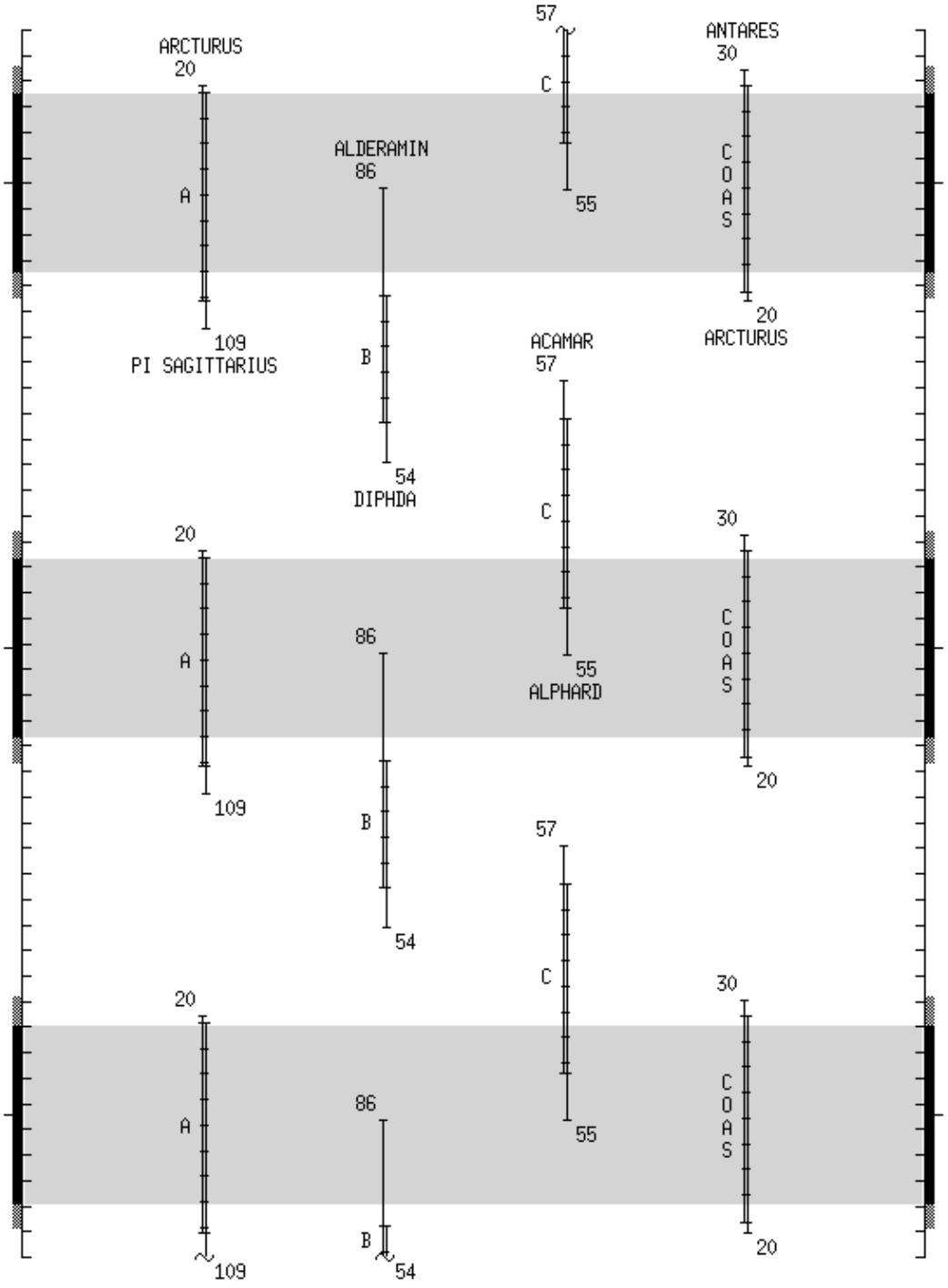
Off-Duty Day of FD9

TDRS	AOS	LOS	Delta (min)	Notes
W-171	7/21:46	7/22:14	38	Time overlaps with PAO Event
W-171	7/23:17	7/23:50	33	

Pre-Sleep Evening of FD9

TDRS	AOS	LOS	Delta (min)	Notes
W-171	8/00:50	8/01:10	20	Time overlaps with PMC
E-TDS	8/01:32	8/01:42	10	
W-171	8/02:26	8/02:39	13	
E-TDS	8/03:05	8/03:21	16	

END OF PAGE 1 OF 1, MSG 098



MET Applicable: 08/00:00 to EOM
Liftoff Date: 05/16/11
Liftoff GMT: 136/12:56:26.000

STAR PAIRS PAD

STAR PAIR	SEP ANGLE	ATTITUDE SET 1			ATTITUDE SET 2		
		DUAL S TRK	SINGLE S TRK		DUAL S TRK	SINGLE S TRK	
			-Z	-Y		-Z	-Y
A	82.4	-Y:20 R+ 297 -Z:109 P+ 291 Y+ 342	R+ 213 -Z:20 P+ 292 Y+ 356	R+ 26 -Y:109 P+ 306 Y+ 340	-Y:109 R+ 333 -Z:20 P+ 117 Y+ 1	R+ 250 -Z:109 P+ 109 Y+ 13	R+ 56 -Y:20 P+ 130 Y+ 7
B	90.0	-Y:86 R+ 17 -Z:54 P+ 275 Y+ 61	R+ 317 -Z:86 P+ 244 Y+ 62	R+ 88 -Y:54 P+ 293 Y+ 74	-Y:54 R+ 219 -Z:86 P+ 57 Y+ 296	R+ 158 -Z:54 P+ 87 Y+ 301	R+ 312 -Y:86 P+ 61 Y+ 281
C	89.9	-Y:55 R+ 143 -Z:57 P+ 119 Y+ 334	R+ 59 -Z:55 P+ 126 Y+ 320	R+ 224 -Y:57 P+ 103 Y+ 330	-Y:57 R+ 126 -Z:55 P+ 303 Y+ 44	R+ 38 -Z:57 P+ 303 Y+ 29	R+ 227 -Y:55 P+ 282 Y+ 42

PAIR		COAS ALIGN ATTITUDE 1	ANG SEP	COAS ALIGN ATTITUDE 2
COAS	+X HUD	30 R+ 359 P+ 137 Y+ 303	NOSE UP 56.0 TAIL UP	20 R+ 52 P+ 208 Y+ 331
	-Z COAS	30 R+ 236 P+ 225 Y+ 356		20 R+ 223 P+ 262 Y+ 40

SINGLE S TRK MIN MNVR OPT
TGT ID = 11-110 NAV STAR #

	-Z S TRK	-Y S TRK
BV	5	4
P	87.7	✓ 0
Y	358	✓ 280.57

MET Applicable 08/00:00 to EOM
Liftoff Date: 05/16/11
Liftoff GMT: 136/12:56:26.000

Box & Roberto,

Welcome to another day of ISS Stowage Ops!

During your Stowage Ops today we prefer for you to work on ULF6 Unpack in the ULF6 Transfer Book. This way you can start getting the PMM cleaned up and we do not feel you have enough time today to dig into the CWC activities. We agree with your comments earlier this week and are working to come up with a location for the extra CWC's that will not fit. Once we have the updated CWC message onboard we will let you know.

Due to the Russian crew sleeping during today's activities we request you do not work in ATV. Also, we believe that Sasha may still be sleeping in the Node 2 Overhead Crew Quarters. There will be more ATV Ops scheduled later during the flight.

Thanks for all of your hard work earlier this week and keep up the great work!

ULF6 ISO Team